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INTEGRATION OF TRANSFORMATIONAL  
THEORIES ON ENGLISH SYNTAX

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## FOREWORD

This work was conducted in support of Project 2801, Task 280115 by the University of California, Los Angeles, California under Contract AF19(628)-6007. The program was monitored for the U. S. Air Force by John B. Goodenough and Lt. J. B. Fraser, and was principally performed during the period 1 April 1966 to 31 August 1968, and the draft report was submitted 1 October 1968.

This Technical Report has been reviewed and approved.

  
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## ABSTRACT

### Integration of Transformational Theories on English Syntax

This study attempts to bring together most of the information about the transformational analysis of the grammar of English that was available up through the summer of 1968, and to integrate it into a single coherent format. The format chosen is that of C. Fillmore (the "Deep Case" hypothesis) combined with the "Lexicalist" hypothesis of N. Chomsky. The areas of close investigation were the determiner system; pronominalization; negation; conjunction; relativization; complementation and nominalization; the systems of interrogative, passive, imperative, and cleft sentences; the genitive; the lexicon; and the ordering of rules for these areas of the grammar.





"But the English.... having such varieties of  
incertitudes, changes and Idioms, it cannot be  
in the compas of human brain to compile an exact  
regular Syntaxis thereof."

James Howell. A New English Grammar,  
Prescribing as certain Rules as the  
Language will bear, for Forreners to  
learn English. London, 1662.



## PREFACE

In the proposal to the sponsor which resulted in our undertaking this research, our aims were stated as below:

A great deal of work has been done recently on English syntax within the framework of transformational grammar. The results of this work, much of it published in relatively inaccessible sources, consist largely of partial descriptions of certain syntactic phenomena and cannot be treated as parts of a single unified grammar as they stand. The discrepancy among these descriptions is partly notational, partly material. It appears both feasible and desirable to bring all the work done to date together into a single presentation, conforming essentially to the theoretical framework presented in Noam Chomsky's Aspects of the Theory of Syntax. The result of the proposed work would be a fully integrated set of rules, annotation of the sources, and modification of them with justification of the modifications and appropriate commentary. Such results would be valuable both to linguists and to groups working on automatic syntactic analysis and other areas of natural-language processing by computer.

Though the task as formulated was thought to be "feasible", it was not as clear three years ago as it is now that the transformational analysis of English had become a many-tentacled monster, with no one being quite sure which tentacle intertwines with which, and the assumption that the task was feasible must be said to have weakened to a modest hope that a certain amount of sorting out and integrating would produce a monster somewhat better defined in structure and scope.

We believe the present work has considerable value in that it gathers together and annotates various transformational analyses of critical areas in English syntax. The rules do not, as they stand, all mesh perfectly, but they share a number of assumptions arising from our aim to make all sections compatible and maximally useful to each other, assumptions about what the grammar as a whole ought to look like, and the rules therefore probably mesh together more satisfactorily than most: and in general there are no contradictions in principle between the rules developed for one part of the grammar and those developed for another.

But the productivity of other scholars virtually cut away any hope that had originally existed for clean results. A glance at the bibliography will show that nearly one-third of the total output which we surveyed in our study was actually produced and

## PREFACE - 2

distributed after the project was initiated: that is, the last three years have seen almost as much new material become available as existed from the work of the previous ten or twelve years. This productive curve appears to be rising exponentially.

The feasibility of the original proposal was weakened not only by the mass of new information and new alternatives that turned up after we started, but also by the fact that there are crucial areas of English syntax which no one has bothered to probe, at least within this tradition. In some of them we made progress, but most of them would require independent investigation as extensive and time-consuming as what we had allotted for the integrative task. The uninvestigated areas continually blocked progress in the attempt to bring together cohesive results within the more familiar areas. The present publication is in every sense interim: we expect to continue in one way or another to try both to integrate what is known of English syntax from this point of view, and to try to explore the areas that are not so richly studied yet. It is interim even with respect to the discussions which occupied so much of our time: though we have tried to incorporate the range and variety of ideas that appear in our (now quite voluminous) notes, there are certainly many gaps in the selection that appears in these papers even from our own notes and discussions.

The three principal investigators have been aided by a highly competent group of graduate students. As one would expect, the group has been somewhat fluid in its makeup, and it is not easy to assign credit exactly where it is due in every instance. Most of the papers here have gone through at least two versions--one for the conference of September, 1967, before we had come to accept Fillmore's Case Grammar as our basic frame of reference, and one developed on that model subsequently--with different people involved with the different versions. The lists below are intended to give credit to these people by listing the areas in which they worked most actively; and where they worked across the board without actually being directly involved in the final or pre-final version of a particular paper, they are listed at the end.

DETERMINERS: Professor Partee, with the assistance of Timothy Shopen and Patricia Wolfe.

PRONOMINALIZATION: Professor Partee, with the assistance of Patricia Wolfe.

NEGATION: Professor Partee, with the assistance of Rae Lee Siporin, Harry Whitaker and Patricia Wolfe.

CONJUNCTION: Professor Schachter, with the assistance of Terence Moore, Timothy Shopen, Timothy Diller and Frank Heny.

RELATIVIZATION: Professor Stockwell, with the assistance of Terence Moore, Andrew Rogers and Timothy Shopen.  
COMPLEMENTATION (now subsumed under NOMINALIZATION): Professors Stockwell and Schachter, with the assistance of Peter Menzel, Robert Terry and Friedrich Braun.  
NOMINALIZATION: Professor Stockwell, with the assistance of Robert Terry, Peter Menzel and Friedrich Braun.  
INTERROGATIVE: Professor Schachter, with the assistance of Peter Menzel and Thomas Peterson.  
IMPERATIVE: Professor Schachter, with the assistance of Frank Heny, Friedrich Braun and Soemarmo.  
GENITIVE: Frank Heny.  
CLEFTING: Timothy Diller.  
PASSIVE: Andrew Rogers.  
RULE ORDERING: Peter Menzel.  
LEXICON: Ronald Macaulay, with the assistance of Robert Terry.  
BIBLIOGRAPHY: Thomas Peterson, Patricia Wolfe, and Andrew Rogers.  
CASE PLACEMENT: Professor Stockwell, with the assistance of Frank Heny.

The presentation of the BASE RULES has been a principal responsibility of Timothy Diller, as well as the presentation of our FORMAL ORIENTATION. Argumentation in respect to our THEORETICAL ORIENTATION owes much particularly to Frank Heny and Robert Terry.

Virtually every point throughout all the papers has received extended discussion by the entire group, and it is difficult to say just who is responsible for any specific contribution that one might wish to single out. References subsequently made to this study should be made, in general, to "UCLA English Syntax Project" (UESP).

Among the graduate students who have not been singled out in connection with the papers included but who have made valuable contributions in a number of areas include Talmy Givon, Jacqueline De Meire Schachter, William Rutherford and John McKay.

It would be pleasant to be able to say that all the members of this research group came through our discussions to share all fundamental assumptions and to be convinced of the correctness of all details in the analyses proposed, or at least convinced of the correctness of the general outlines in all instances. Inevitably, such is not the case, though agreement throughout is of a considerably higher order of magnitude than we originally anticipated would be possible. We have tried in these papers to indicate those points at which our analyses differ from those of scholars outside this group and occasionally those where there is disagreement among us.

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We are grateful for and somewhat apologetic to our two sources of computer support, which would have enabled us to test our grammar for internal consistency if more of the rules had been written in an explicit form at an earlier stage. David Londe and William Schoene at System Development Corp. developed an on-line transformational grammar tester which was potentially very helpful but which we never actually utilized. Joyce Friedman and a group of her graduate assistants at Stanford developed an extremely powerful, efficient and convenient transformational grammar tester with on-line grammar editing and off-line testing (cf. Friedman 1968a, Friedman and Doran 1968 and Friedman and Bredt 1968) which we were able to use with two small test grammars (included in Friedman 1968b). In addition to its practical value in de-bugging grammars, the system contains an explicit characterization of a possible form of transformational grammar, a number of whose novel features we have incorporated into our model. We regret not having been able to formulate a number of crucial parts of the grammar until quite late in the project (e.g. the early transformations required by the adoption of the case grammar framework) and would hope to have an opportunity to further utilize Friedman's system in the future, since on the one hand the system is a pleasure to work with and on the other it or something very much like it is essential if a grammar this large and complex is ever to be made to actually generate the sentences it claims to account for.

Finally we wish to express our appreciation to the following group of scholars who have visited us as consultants on various occasions and have provided valuable suggestions and criticisms of our work at one stage or another (in general during the earlier stages: none of these consultants had a chance to read and criticize the contents in their present form): Charles Fillmore (Ohio State), Hugh Matthews (M.I.T.), Jeffrey Gruber (System Development Corp.), John Ross (M.I.T.), Paul Postal (I.B.M.), Sanford Schane (U.C.S.D.), Stanley Peters (Texas), Emmon Bach (Texas), Lila Gleitman (Eastern Pennsylvania Psychiatric Institute), Bruce Fraser (Boston), Arnold Zwicky (Illinois) and Edward Klima (U.C.S.D.).

The group that at the end tried to tie the work together consisted of Professors Stockwell and Partee, and Frank Heny, Peter Menzel, Patricia Wolfe, Andy Rogers, and Ronald Macaulay. This was the entire research group for most of the last nine months, having been reduced to this size by a variety of circumstances and prior commitments to other tasks on the part of several members of the earlier larger group, after we went well beyond all projected



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deadlines. The principal investigators are deeply appreciative of the dedication and willingness to work on and on without compensation that made it possible for the small group above finally to bring the work to its present form. We wish also especially to thank the non-academic staff who have handled all the routine of typing, reading copy for press, fiscal matters, and the like: Anna Meyer, Theodora Graham, Julie Schopf, Loys Wood, and Virginia Rogers.

Finally, we wish to express our appreciation to Bruce Fraser, who as Lieutenant in the Office of the Air Force Systems Command encouraged us to undertake this work and persuaded his office to provide financial support; and to the Command Systems Division and Electronics Systems Division of the Air Force Systems Command at Hanscom Field, Bedford, Massachusetts, who waited patiently for us to finish something, even as partial and tentative as this.

Robert P. Stockwell  
Paul Schachter  
Barbara Hall Partee

UCLA, August, 1969





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## GENERAL INTRODUCTION

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### I. Theoretical Orientation

This grammar attempts to integrate two recent hypotheses on the nature of deep structure: (1) the lexicalist hypothesis described by Chomsky (1968) and (2) the deep case hypothesis of Fillmore (1968). The substance of the arguments of both men, together with the additional arguments of the UCLA English Syntax Project, are presented below. Historically, the Syntax Project accepted the arguments for the lexicalist hypothesis first (and indeed anticipated a number of these arguments in a working paper of September, 1967), and subsequently adopted a grammatical format containing deep case relations as the simplest means of recapturing generalizations that had been lost by adoption of the lexicalist hypothesis.

#### A. The Lexicalist Hypothesis

Lees (1960) proposed rules to derive from underlying sentential structures all kinds of nominals that were related to verbs and adjectives. The present grammar views all nominals except infinitivals, gerundives, and that-clauses as lexical units, shown to be related to their verbal and adjectival counterparts by lexical properties but not transformationally derived from them.

The arguments against the transformational derivation of nominals like proposal, insistence, easiness, amusement, eagerness, certainty, ... are of two general types: (1) those which depend on semantic properties of the nominals in comparison with the verbal/adjectival cognates; and (2) those which depend on unpredictable syntactic properties of the nominals. The examples below are from Chomsky (1968):

- (1) (a) John is easy to please. [(6.i)]
  - (b) John is certain to win. [(6.ii)]
  - (c) John amused the children with his stories. [(6.iii)]
  - (d) John is eager to please. [(2.i)]
- (2) (a) \*John's easiness to please... [(8.i)]
  - (b) \*John's certainty to win... [(8.ii)]
  - (c) \*John's amusement of the children with his stories... [(8.iii)]
- (3) (a) John's certainty that Bill will win the prize... [(9.ii)]
  - (b) John's amusement at the children's antics... [(9.iii)]
  - (c) John's eagerness to please... [(9.i)]

Chomsky pointed out that the productivity of nominalizations of these types is quite restricted, a fact difficult to explain under the assumption of a transformation derivation, since the nominals of the gerundive, infinitival, and clausal types which everyone agrees are transformationally derived are totally productive:

- (4) (a) John's being easy to please... [(7.i)]
  - (b) John's being certain to win... [(7.ii)]
  - (c) John's amusing the children with his stories... [(7.iii)]
  - (d) John's being eager to please... [(10.i)]
  - (e) They expected John to be easy to please.
  - (f) They expected John to be certain to win.
  - (g) They expected John to amuse the children with his stories.
  - (h) They expected John to be eager to please.
  - (i) They knew that John was easy to please.
  - (j) They knew that John was certain to win.
  - (k) They knew that John would amuse the children with his stories.
  - (l) They knew that John was eager to please.

That is, the nominalizations of (4), unlike those of (2) or (3), can be derived as Chomsky says, "without elaboration or qualification" (1968, p.7).

But more important than productivity is the apparent semantic idiosyncrasy of the derived nominals in relation to any putative underlying proposition. As Chomsky remarked, "the semantic relations between the associated proposition and the derived nominal are quite varied and idiosyncratic" (1968, p.7), and "the range of variation and its rather accidental character are typical of lexical structure" (1968, p.10). He points out that one could account for these differences by means of assignment of meanings to the underlying forms and limiting nominalization to just the right cases of feature cooccurrence, but such a device "reduces the hypothesis that transformations do not have semantic content to near vacuity" (1968, p.10). Consider now some examples of this kind of semantic variation:

- (5) (a) The president proposed to end the war in Viet Nam.
- (b) The president's proposal to end the war in Viet Nam...
- (c) The tradition continued.
- (d) The continuation of the tradition...
- (e) The continuity of the tradition...
- (f) He referred me to the dictionary.
- (g) His referral of me to the dictionary...
- (h) He referred to the dictionary.
- (i) His reference to the dictionary...

(5.a) appears to involve equi-NP-deletion--that is, it asserts that the president's proposal was that he would bring an end to the war. (5.b) is ambiguous between equi-NP-deletion and indefinite-NP-deletion--that is, it asserts either that his proposal was that he would end it, or that someone would end it. (5.c,d,e) pose a different kind of problem for the transformational derivation: it is clear that (5.d) and (5.e) are semantically different, and both should not derive from the same proposition. (5.f,g,h,i) pose a similar problem, but perhaps more difficult in view of the fact that there is a syntactic distinction as well as a semantic one, namely that there is a potential dative in the case-frame of referral but not in the case-frame of reference. All these facts are easily statable within a lexical derivation, without losing the equally important generalization that the nominals and their verbal/adjectival cognates share a set of semantic and syntactic features. It may well be possible to state them in a transformational derivation also, but it is not obvious how this might be done without losing the generalization that transformations are meaning-preserving.

The other kind of argument, namely the syntactic properties of derived nominals that are not predictable from knowledge of some underlying proposition containing a cognate verb or adjective, may be illustrated with the examples:

- (6) (a) Much of the construction of the bridge that they undertook last year turned out to be futile.
- (b) \*Many of the constructions of the bridge...
- (c) I don't have much expectation of success.
- (d) I don't have many expectations of success.
- (e) His enthusiasm is annoying.
- (f) \*His enthusiasms are annoying.
- (g) His criticism is annoying.
- (h) His criticisms are annoying.
- (i) His inference was correct.
- (j) His inferences were correct.
- (k) His insistence was emphatic.
- (l) \*His insurances were emphatic.

From even a minute survey of examples, one must conclude (1) that such purely noun-like features as [+/-COUNT] are not predicable either from a knowledge of the underlying proposition or a knowledge of properties of the particular affix; it is true that there is some regularity--e.g. the affixes -al and -ure are generally [+COUNT], and the affixes -ledge and -ity are generally [-COUNT], but the affixes -tion, -m, -ment, -nce go either way; (2) derived nominals freely take relative clauses, a property of nouns in general, but gerundive, infinitival and clausal nominalizations totally exclude relative clauses; this fact must be considered to have perhaps more weight than all the others put together, since the exclusion of relativization is a completely natural consequence in an analysis where relative clauses are dominated either by DET or by NOM (see REL) and nominalizations are dominated only by NP--but it requires entirely ad hoc constraints in an analysis which either has relative clauses directly dominated by NP, or which derives all nominals from propositions, both those which accept relative clauses and those which do not. In general, then, derived nominals behave like nouns in all respects--full range of determiners, relativization, noun features like [+/-COUNT] governing pluralization and determiner selection.



The two kinds of arguments illustrated above--semantic and syntactic idiosyncrasies of derived nominals, in relation to their cognate verbs or adjectives; and the purely noun-like characteristics of such nominals--are strongly reinforced by the observation that there is a class of nouns which have the same characteristics that led scholars to argue that deverbal nouns were transformationally derived, namely that they take the range of complement structures normally posited for verbs. These nouns, however, do not have cognate verbs or adjectives to serve as sources of transformational derivations: idea, opinion, fact, notion, news,...The similarity of structures like (7) led Lakoff (1965) to posit underlying verbs of the type asterisked below:

- (7) (a) The proposal that she should leave...
- (b) The opinion that she should leave...
- (c) \*Someone opinioned that she should leave.
- (d) His conclusion that the analysis was wrong...
- (e) His idea that the analysis was wrong.
- (f) \*He ideaed that the analysis was wrong.

But if there is reason to believe that "The proposal that she should leave..." is not transformationally derived from "Someone proposed that she should leave" but only lexically related to it, and similarly through the full range of such instances, then the alternative to positing fictions like (7.c,f) is to posit an internal structure for NP's which corresponds to the internal structure of VP's in respect to possible complementation. To accomplish this, Chomsky proposed the X-Bar Convention (discussed in detail below under Section II of this General Introduction), which provides a general account of the internal similarity of NP's and VP's.

In the form which it took in the original paper (Chomsky, 1968) this proposal contains a number of difficulties. The essential, and at least partially correct, claim appears to be that certain words act alike in regard to selection, behavior under transformations, and semantic relationships, not because one of the items is derived from another but because, in the lexicon, they possess common elements. In other words, there are common factors to which category differences such as differentiate nouns and verbs from one another are irrelevant. Thus, the lexicalist hypothesis as opposed to the transformationalist hypothesis (which claims that propose and proposal are related because the latter is derived from the former) maintains that parallel but distinct structures containing these forms are generated at the outset. The arguments for this have been set out above. Given, then, that the lexicalist position is well motivated, it is important to illustrate, in some detail, the essentially parallel structures incorporating nouns and verbs (and adjectives) and show that these, too, are well motivated in the grammar. It is not clear that Chomsky's original proposal could do this.

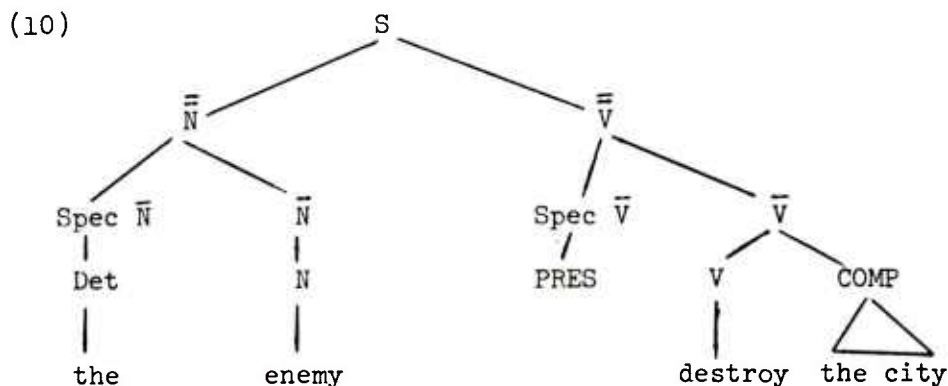
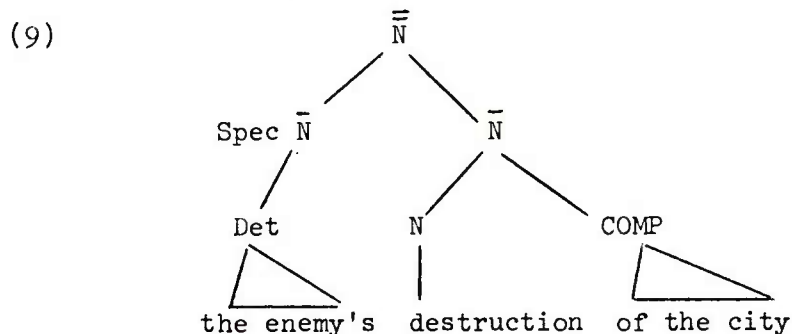
He relied upon the notions head, complement and specifier. For any lexical category  $X$ , the highest relevant level of structure, represented by convention as  $\bar{\bar{X}}$ , incorporated the immediate constituents specifier-of- $\bar{\bar{X}}$  and  $\bar{\bar{X}}$ , the latter breaking down into the head,  $X$ , and its complement. Chomsky's argument depended, at least in part, on his claim that, whether the head of a construction was  $V$  or  $N$ , the dependent structures ( $\bar{V}$ ,  $\bar{\bar{V}}$ ;  $\bar{N}$ ,  $\bar{\bar{N}}$ , etc.) exhibited significant parallels. Unfortunately, the parallelism breaks down at a number of crucial points as long as one assumes a deep structure subject-predicate analysis of the sentence. We shall cite only a few of the more important cases of breakdown. Take the following two forms:

- (8) (a) The enemy destroyed the city.  
(b) the enemy's destruction of the city

Any descriptively adequate account of these must in some way deal with the fact that enemy and destroy/destruction are in essentially the same grammatical relationship to one another and to the remainder of each respective form, in the two examples. Yet the original proposal incorporated a rule:

$$S \rightarrow \bar{\bar{N}} \bar{\bar{V}}$$

placing the enemy in (8.a) outside  $\bar{\bar{V}}$ ; while in (8.b), the enemy's is generated not outside of  $\bar{\bar{N}}$ , but within the specifier-of- $\bar{\bar{N}}$ , i.e. within the Determiner. Roughly the two structures correspond to:





Superficially these seem to be quite reasonable structures. Each reflects the main characteristics of most generative analyses of NP and S respectively but using new labels. Even the fact that the enemy is contained in  $\bar{N}$  but excluded from  $\bar{V}$  seems semantically reasonable if it represents a way of capturing the fact that in (8.a) there is a (logical) predication on the enemy, while this is not so in (8.b). However, it is not clear that this is the right way to represent the difference, or that the difference should be exhibited in the base at all. In any case, it is quite clear that insofar as there is indeed a difference in deep structures, this amounts to a breakdown in the parallelism on which the lexicalist hypothesis depends.

The lack of parallelism between  $\bar{N}$  and  $\bar{V}$  introduced by Chomsky's base structure manifests itself in other ways. In (8.a,b) the enemy is in the same relationship to destroy and destruction respectively, from the point of view of sub-categorization, selection and semantic interpretation. The lexicalist hypothesis demands that this be attributed, so far as possible, to similarities in the respective deep structures of these forms, which can be reflected in economies in the lexical entry. However, in fact, the enemy is, in (9), an  $\bar{N}$  dominated by Spec  $\bar{N}$ , but in (10) an  $\bar{N}$  which, with the corresponding  $\bar{V}$ , is in IC of S.

Thus, it is impossible to represent in a uniform manner the fact that the subject of destroy and the genitive phrase with destruction must both be [+ concrete].

Notice, further, that whereas all sentences (in English) have subjects, it is obviously not true of noun phrases ( $\bar{N}$ ) that they all have genitives. For example, the following are perfectly satisfactory paraphrases:

- (11) (a) Constable's painting of Salisbury cathedral  
(b) the painting of Salisbury cathedral by Constable

There is no genitive in (11.b). Compare the corresponding sentential forms:

- (12) (a) Constable painted Salisbury cathedral.  
(b) \*(was) painted Salisbury cathedral by Constable

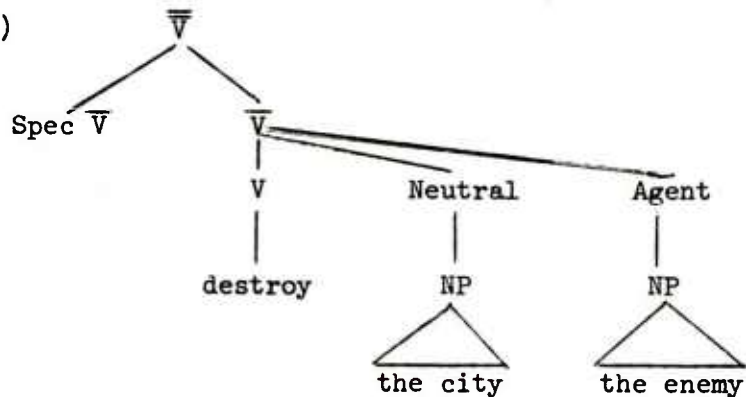
If subject and genitive are generated in the base, it is necessary to have quite different base rules for  $\bar{N}$  and  $\bar{V}$  (or sentence), to account for (11.b) and (12.b). When N is the head of the construction, the genitive (equivalent to subject) is

optional. But when V is the head, the subject is obligatory. On the other hand, within a case grammar the same base rules will apply to both structures but lexical entries and subject-placement transformations will differ (though only trivially) for N and V.

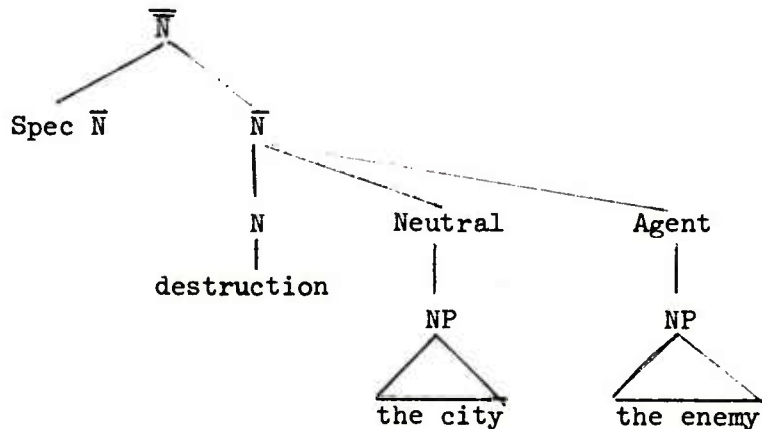
Thus there are at least two distinct arguments for the incompatibility of the X convention with a subject-predicate analysis of the sentence. Our adoption of a deep structure containing cases has been largely the result of our (logically and historically) prior commitment to an account of lexical relatedness which depends on parallel deep structures. Obviously, insofar as a model emphasizes those aspects of grammatical relationship which are independent of predication and assertion it is well-adapted to such a purpose. Since the deep structure based on cases recognizes no special significance in the subject of a sentence, or, of course, in a genitive, it is to that extent well-adapted to the lexicalist hypothesis. The basic case relationships are, it appears, precisely those which persistently appear both in noun phrases and sentences.

For example, (8.a) and (8.b) would be represented thus in the deep structure, omitting irrelevant details:

(8.a')



(8.b')



It is, moreover, possible to argue independently for the adoption of case structure in the base. We shall deal with these arguments very briefly in the next section.

## B. The Deep Case Hypothesis

Fillmore in four papers (1966a, 1966b, 1967a, 1967b) has argued that the functional relations of constituents of a sentence are simply defined by a set of functional primitives that dominate NP's. These cases define such functions as dative, instrumental, locative, agentive. Fillmore claims that the subject of a sentence is a derived relation, not a relation of the deep structure. It turns out that this is true of the object, too. The separation of "subject" and "object" from deep structure functional relations yields, as we have pointed out above, a significantly more appropriate structure for the basis of Chomsky's  $\bar{X}$  convention. The deep cases are posited to have consistent interpretive values:

- (13) (a) John broke the window with the hammer.  
           AGT                   NEUT           INS
- (b) The hammer broke the window. [No Agent]
- (c) The window broke. [No Agent or Instrument]
- (d) They filled the pool with water.  
           AGT                   LOC       NEUT
- (e) The pool filled with water. [No Agent]
- (f) Water filled the pool. [No Agent]
- (g) He heard the music.  
           DAT                   NEUT
- (h) He listened to the music.  
           AGT                   NEUT
- (i) The enemy destroyed the city with bombs.  
           AGT                   NEUT       INS
- (j) The enemy's destruction of the city with bombs...
- (k) The bombs' destruction of the city... [No Agent]
- (l) The bombs destroyed the city. [No Agent]
- (m) The city was destroyed by the enemy with bombs.  
           [Passive of (i)]
- (n) The city's destruction by the enemy with bombs...  
           [Passive of (j)]

The present grammar posits only the cases NEUTRAL (the case associated most closely with the verb itself, and least interpretable independently of the verb), DATIVE, LOCATIVE, INSTRUMENTAL, AGENTIVE, and a case restricted to copulatives (ESSIVE). Fillmore has suggested that there are a number of additional cases any of which might be present or absent in any given language, but all of which would be described and defined in a general theory of language. The fact that we have constrained this grammar to the small set of cases listed above has led to a number of difficulties:

e.g. the lack of a temporal case makes it impossible to state the constraints on a verb like elapse; the lack of a means/manner case causes us to put under instrumental some NP's where the interpretation "instrument" is severely strained, as in our claim that the subject of "The fact that he had blood on his hands proved that he was guilty" is an instrumental; we have numerous difficulties in distinguishing between instances of adverbial kinds of structures that are within the case frame, and those that are somehow outside it, largely because, in common with the entire field of transformational scholarship, we provide no serious analysis of adverbials in general.

Among the independent arguments for postulating a case structure in the base, the following have impressed us.

(a) The Simplification of Lexical Entries

Consider the following sentences:

- (14) (a) The window broke.
- (b) The hammer broke the window.
- (c) John broke the window.
- (d) John broke the window with a hammer.

In the Aspects model it remains an unexplained fact that window can occur as subject of break only when there is neither object nor instrumental with-NP, while the hammer can be subject just in case there is an object but no animate NP and no with-NP. Further, if there is an animate NP in the sentence, then it is the subject, and only then is the with-NP permitted. Complicated sub-categorization and selectional restrictions of, perhaps, several verbs break, one intransitive, are required to describe the situation, and none explains it or accounts for the meaning relationships in the sentences of (14) systematically. Hall (1965) suggested that when a verb of the break class lacked a subject in deep structure, the deep structure object was moved into (surface) subject position. However, it appears that case relationships in the base can provide a better account than one in which deep structure subjects are ever assumed. Break simply requires a neutral case; it may have an Agent or Instrumental. Which cases are realized as subject and object is determined by general rules. Fillmore (1967b) has pointed out that this account avoids several specific problems. For example (14.a') is not well-formed:

- (14) (a') \*The window struck

Yet all other forms comparable to (14.b-d) occur. Hall (1965) pointed out difficulties in dealing with this difference between break and strike within a modified Aspects framework. But it is a simple matter to say, within a case framework, that strike requires either Agent or Instrumental, while the other verb does not. It is not clear how far this kind of account should be extended, to allow buy and sell, for example, to be a single lexical entry with two distinct possibilities for subjectivalization operating. Gruber (1967) has attempted to extend this notion perhaps further than anyone else.

Related to this, but less directly relevant to our grammar, is the fact that a deep structure based on cases is easily able to provide a general (semantic) account of the anomaly of (16.b), since break does not allow a Locative (cf. Fillmore (1967b)).

- (15) (a) I hit his leg.
- (b) I broke his leg.

- (16) (a) I hit him on the leg.
- (b) \*I broke him on the leg.

(b) Constraints on Possible Relations in a Simplex Base

It is possible that the sort of base structure implied by Lakoff (1965), which is very simple and incorporates no cases, would adequately handle the facts dealt with in the last section. Various transformations such as the Inchoative and Causative were proposed for this purpose, and these would relate the sentences of (14) to one another. However, it is not clear how such a proposal would deal with the fact that, in terms of case grammar, there is only a single Agent or Dative (etc.) within any one simplex sentence. This the case hypothesis does automatically. To the extent that such constraints, imposed on possible deep structures by that hypothesis, match the observed characteristics of natural language, case grammar is somewhat vindicated, especially if the higher sentences postulated by Lakoff and others are otherwise unmotivated.

It is not yet clear how far the cases are semantic primitives (rather than, say, complexes of features); nor is it certain that they allow us properly to distinguish the functional and categorical aspects of deep structure (cf. Matthews (1968)). But the complex base structure which the case hypothesis entails appears to us rich in approximately the right way to account for important aspects of language structure.



(c) Second Passive and Raising Rules

In CASE and NOM, we show how various phenomena, including data accounted for by Lees (1960a) with a second passive rule, or by Rosenbaum (1967a) with It-replacement, are naturally provided for by additional, optional placement rules which move an NP from subject or object of a sentence dominated by Neutral case, to become subject or object of the higher S.

In this way we capture important syntactic and selectional facts. Thus we can state very easily the relations between believe and an embedded sentence in the following way. In (17.a) the optional raising rule has applied, but not in (b). When the passive applies to such structures as underlie (a) and (b), (c) and (d) result.

- (17) (a) John believed Bill to be sick.
- (b) John believed that Bill was sick.
- (c) Bill was believed to be sick.
- (d) It was believed that Bill was sick. (from that Bill was sick was believed)
- (e) Bill was believed by John to be sick.

Now, since there is, in the deep structure, neither subject nor object in this grammar, it would appear that Bill, subject in (17.c), is subject, in the same way (roughly speaking), that John is subject of (17.a) and that Bill is subject of (17.e). Yet we are in no way prevented from stating the fact that believe may select a Neutral case dominating a sentence. At the same time, constraints holding between the subject of verbs like try and avoid and the subject of a sentence embedded below them can apparently be stated more effectively in terms either of subjects formed by any but the Passive-subject rule, or of deep structure Agent cases. For further details see NOM.

We conclude, then, that the Lexicalist and the Deep Case hypotheses, each with a fair range of independent motivations, reinforce each other very strongly indeed, and we have gone ahead to attempt to build a grammar on this compound basis. Numerous difficulties, as well as unexplored areas, remain; but without this integration of these two hypotheses, it appears to us that the problems are even more severe.

December 1968

## II. Formal Orientation

### A. Introduction

This section contains a collection of the most important of the formal characteristics of the UCLA English Syntax Project grammar. An annotation of the terminology, rule types, conventions, etc., which have been employed in previous generative descriptions is not provided. The reader must judge for himself the relative merits of the present options in the light of others.

We shall consider types of rules, lexical matters, conventions, schemata and feature phenomena.

### B. Types of Rules

There are three major kinds of rules we shall be interested in: phrase structure (PS) rules, transformational (T) rules and lexical (L) rules (redundancy rules). Since we employ the "dummy symbol" variant of lexical insertion (Chomsky, 1965), we do not have what Rosenbaum (1968) calls "segment structure rules", i.e., rules which convert terminal symbols into "preterminal complexes" of features. This latter approach is relevant only to the "matching convention" variant of lexical insertion, where feature complexes at the end of the PS rules are matched for non-distinctness with feature complexes in the lexicon.

#### 1. Phrase Structure Rules

Part I of the UESP grammar employs a set of context-free rewrite rules of the following form:  $A \rightarrow B$ , where A is a single non-null symbol and B is a non-null string of symbols,  $B \neq A$ . These are phrase structure (PS) rules. They are intrinsically ordered with S the initial symbol. That is, after S is rewritten, any rule applicable may be applied until all symbols are terminal.

When the PS rules are sequentially applied starting with the initial symbol, S, a derivation results. The final line in a completed derivation consists of terminal symbols, those symbols which appear only on the right side of a PS rule. A particular derivation is convertible into both tree (P-marker) and labelled bracketing formats. An example follows:

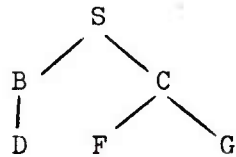
(1) PS RULES

$$\begin{aligned} S &\rightarrow B C \\ B &\rightarrow \left\{ \begin{array}{c} D \\ E \end{array} \right\} \\ C &\rightarrow F (G) \end{aligned}$$

(2) DERIVATION

$$\begin{aligned} S \\ BC \\ DC \\ DFG \end{aligned}$$

(3) TREE



(4) LABELLED BRACKETING

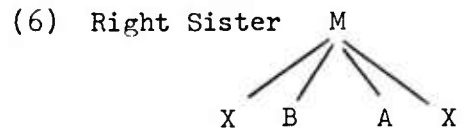
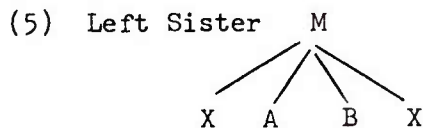
$$S[ B[D] C[F G] ]$$

We shall use the tree format almost exclusively for illustrative purposes but the labelled bracketing format is used in the structure indices of transformations.

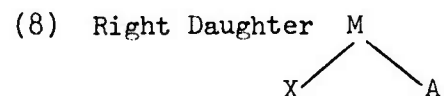
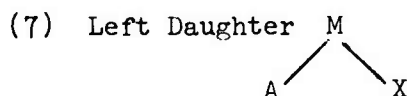
A string of symbols uniquely traceable up a tree to a single symbol X is an X. Thus in (3), F G is a C and D C is an S.

If A is in a string which is an X, then X dominates A. If there is no intermediate symbol between S and A, then X immediately (directly) dominates A.

Within structures of immediate dominance, there are four particular relations worth signalling out. A is left (right) sister of B if both A and B are immediately dominated by the same node and if A is left (right) of B, there being no node in between them. Viz.,



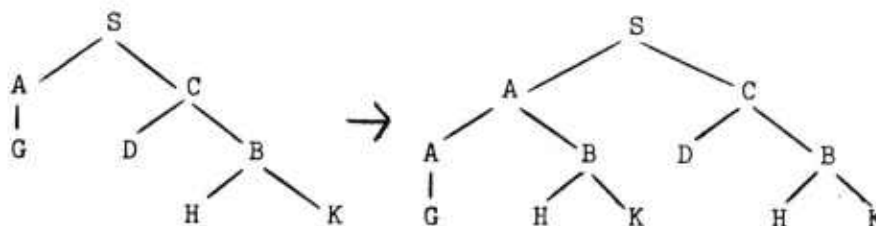
A is left (right) daughter of M if M immediately dominates A and there is no node dominated by M to the left (right) of A. Viz.,







Similar instructions are: "Attach 4 as the right daughter of 1" and "Attach 4-7 as right sisters of 1". In addition, we have occasionally made use of what is sometimes called "Chomsky-adjunction" as a special type of adjunction, involving a copying of the node to which another node is being adjoined. For example, the instruction "Chomsky-adjoin 3 as right daughter of 1", where 3 and 1 are respectively the B and A subtrees of the following tree, has the effect indicated below:



We consider it highly unlikely that plain and Chomsky-adjunction should both be necessary in an adequate theory of grammar, but we feel that there is too little evidence available about the correct form of derived structures to be able to make a decision at this point.

As the example (9) illustrates, it is possible to add completely new items by T's. Those items may be features or complex symbols, i.e. complexes of features which will receive a phonological realization in the second lexical look-up. We have specifically rejected the addition of schemata (cf. the section on schemata following). Likewise, we have attempted to limit the utilization of T's for the insertion of symbols which would block a P-marker. We believe any such use of a rule is a reflection of a weakness in the description. At present we have at least one such "blocking transformation", namely, "Attachment Block" in DET. One final use of SC's is the modification of existing terms in the SI. Thus the specification of features may be changed by a T-rule.

The use of component structural change statements contrasts with another familiar notation in linear form, as in, e.g. 1-2-3 → 3-2+1-∅. The linear notation is less suitable for a framework which, like ours, permits the assignment of integers in the SI to nodes one of which dominates another, since the linear sequence on the left of the arrow traditionally corresponds to a partitioning of the terminal string. Thus, given,

SI: A[B C] D F

1 2 3 4 5

SC: Attach 5 as right sister of 1  
Erase 3, 5

there is no reasonable corresponding linear representation 1-2-3-4-5 → ??.

In cases where no such problems arise, the linear form has sometimes been used, with "-" separating terms of the SI, "+" used for sister adjunction, and "Ø" for deletion.

Note that with the componential rather than linear specification of the SC, there is in fact no need to number any terms of the SI that are not involved in either the SC or the conditions; however, a full set of numbers has been given in most cases anyway.

(c) Conditions commonly require identity or non-identity between terms in the SI. When the terms compared are nodes, identity (or non-identity) extends to every item dominated by the nodes. Other conditions state restrictions on dominance and non-dominance relations. The optionality, partial optionality or obligatoriness of the T is also stated as a condition.

Transformations may be subclassified under several parameters. The first parameter of significance separates those T's which operate cyclically (e.g. the case-placement rules) from those which operate only on the last cycle (e.g. the interrogative inversion, IMP subject deletion). The concept of cyclical application of T rules is basically that proposed in Chomsky (1965) but extended to include cycling on NP's. The operation of the T-cycle is discussed in TRANS RULES.

T's also differ as to their obligatory and optional status. Some T's must apply every time their SI is met. Others are optional in their application. A third set are partly optional, i.e., if a certain condition is met they are obligatory (optional), if not they are optional (obligatory).

In Part II we shall present many T's in two ways. The first presentation will be a gross oversimplification of the rule. It is intended to provide an easy grasp of the purpose and operation of the rule. The second presentation will be more detailed and is intended to capture the full complexity of the data as we analyze them. In Part III, the detailed forms are given, with occasional minor changes for the sake of consistency.

### 3. Lexical Rules

A third set of rules is present in the lexicon. They are of the type  $[\prec F] \rightarrow [\not\prec G]$  and are interpreted as adding feature [G] with value  $\not\prec$  to any complex symbol which is specified for feature [F] with value  $\prec$ . Thus, (11) is changed to (12) by L rule (10):

(10) [-FACT] → [-GER]

(11)  $\begin{bmatrix} \text{order} \\ +V \\ \cdot \\ \cdot \\ -\text{FACT} \end{bmatrix}$

(12)  $\begin{bmatrix} \text{order} \\ +V \\ \cdot \\ \cdot \\ -\text{FACT} \\ -\text{GER} \end{bmatrix}$

Rules of this type permit the omission of redundant features in lexical entries. That is, those features which are predictable because of the presence of certain other features are not listed in the lexicon but added for all lexical entries through a small number of L rules. As an example, any item having the feature [+DEF] will by redundancy rule (13) be specified [-ATTACH]:

(13) [+DEF] → [-ATTACH]

A marking convention has been incorporated into the redundancy rules to a limited degree. Cf. NOM and SAMPLE LEX.

Basically the L rules are assumed to operate on lexical items before they are inserted into the P-marker. They are also assumed to be intrinsically ordered, i.e. with no explicit statements required. The consequences of these assumptions, however, have not been fully explored.

After the application of the L rules it is assumed that every lexical item will bear one of three possible relationships to every feature. First, it may be specified positively for Feature [F], i.e. [+F]. Second, it may be specified negatively for feature F, i.e., [-F]. Third, the feature may be absent from a particular lexical entry, as typically happens if the feature is irrelevant to that entry.

The L rules contain a further (not explicitly stated) universal rule schema called "obligatory specification". The schema applies to features which have, in the lexical entry, the special value "\*" (occasionally written as  $\pm$  or +/-), and assigns arbitrarily to each such feature either of the values + or - before the lexical item is inserted into the P-marker. The crucial difference between absence of a feature in a lexical entry and its presence with the value "\*" is that in the latter case a specific value will always appear when the item is inserted into a P-marker, whereas in the former case it may remain unspecified (and in fact, will unless a value is assigned by an ordinary L-rule). For example, book is unspecified for the feature MASC,

whereas neighbor is \*MASC. The value \* occurs only in lexical entries, never in P-markers. It may occur on inherent features, as in the case just cited, or on rule features. For example, the rule which deletes to in certain infinitival constructions (e.g. John made Bill  $\cancel{to}$  sit down) is an obligatory rule which requires that the matrix verb have the feature +TO DEL. The verb help is marked [\*TO DEL] in the lexicon in order to permit derivation of both forms of (14):

(14) John helped him (to) do the job.

## C. Lexical Matters

### 1. Order of Insertion

It is assumed in the UESP grammar that lexical insertion operates sequentially in that categories have an order of precedence. The full ordering is discussed in TRANS RULES. We note here simply that V-insertion precedes N-insertion. This depends on a new notion of "side effects" developed by Friedman and Bredt (1968 and discussed in SAMPLE LEX).

Lexical insertion is also sequential with respect to a single category. Note for example that some verbs (e.g. persuade) in one sentence require the verb in a lower embedded sentence to be [-STATIVE]. There are also nouns which require particular features on other nouns which are in case relationship with them. Cf. the SAMPLE LEX for more discussion of these phenomena.

### 2. Place of Insertion

In contrast on the one hand to almost all pre-1968 TG's which had only a single place of lexical insertion (following the PS rules) and on the other hand to Rosenbaum (1968) who has lexical insertion after the PS rules and every subsequent T, the UESP grammar posits only two places of lexical insertion: viz. after the PS rules and after the T rules.

Insertion after the PS rules is referred to as the first lexical lookup. In an optimal grammar, this lookup would involve phonological, syntactic and semantic features for most entries and only the latter two types of features for a smaller number of entries. In the present grammar, no semantic features are given and only an orthographic representation is provided phonologically.



Lexical insertion at the end of the T rules is referred to as the second lexical lookup. It specifies only phonological information and only involves those items without phonological features in the surface structure, i.e. those items which had no phonological form in the first lexical lookup and those which were inserted transformationally.

#### D. Conventions

##### 1. General notational conventions

(i) When examples or rules are borrowed the source will be indicated near the right margin within square brackets [ ]. For example,

(15) Schwartz claims he is sick. [Postal, 1966 (16)]

The author and date are often omitted if they are specified in the text.

(ii) Subscript nodes indicate dominance, either immediate or indirect; e.g. [...NP...]<sub>ESS</sub> means that ESS dominates NP either directly or indirectly. Superscripts indicate immediate dominance; e.g. <sup>S</sup>[X MOD X] requires that the given S immediately dominate the given MOD.

(iii) Three dots indicate that more nodes may occupy the space they take up; e.g. [...NP...]<sub>ESS</sub> means that NP may have nodes contiguous to it on either side which are also dominated by ESS. This is equivalent to the notation [X NP X]<sub>ESS</sub> and the two are used interchangeably.

(iv) The symbols = and ≡ are used rather indiscriminately for "equal" and "identical". Their negative counterparts ≠ and ≠) are also used. Context usually clarifies the type of identity meant, i.e. referential or formal.

##### 2. Conventions Applicable to Rules

(i) Braces { } are used to collapse two or more rules with mutually exclusive alternative expansions. Thus (16) is an abbreviation for (17):

(16)  $A \rightarrow \begin{Bmatrix} B \\ C \end{Bmatrix}$

(17)  $A \rightarrow B$   
 $A \rightarrow C$

Whenever A must be rewritten, one must choose either B or C.

(ii) Parentheses, ( ), indicate optionality of the symbol(s) enclosed. Thus, the two mutually exclusive rules of (18) are abbreviated by (19):

(18) a.  $A \rightarrow B$   
       b.  $A \rightarrow B C$

(19)  $A \rightarrow B (C)$

(iii) If all items in a rewrite are optional, at least one must be chosen. Thus, (20) is an abbreviation of (21):

(20)  $A \rightarrow (B) (C)$

(21)  $A \rightarrow B$   
        $A \rightarrow C$   
        $A \rightarrow B C$

(iv) If optional items are embedded within other optional items in a PS rewrite, to choose the inner optional item one must also choose what is in the next layer of embedding out. Thus, for example, (22) has only the rewrites of (23); (24) is impossible.

(22)  $D \rightarrow \text{ART} ( \text{POST} ( \text{PART} ) )$

(23) a.  $D \rightarrow \text{ART}$   
       b.  $D \rightarrow \text{ART POST}$   
       c.  $D \rightarrow \text{ART POST PART}$

(24)  $*D \rightarrow \text{ART PART}$

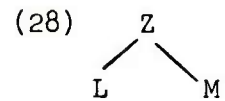
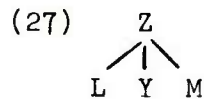
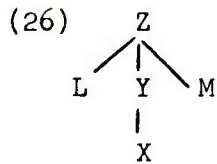
(v) As noted above, square brackets [ ] combined with subscript PS symbols are used in the SI's of T's to represent dominance relations. Thus in (25), A must dominate the feature [+B] for the T-rule to apply:

(25) SI:  $X \quad A[X [+B] X] X$

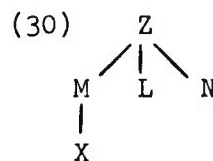
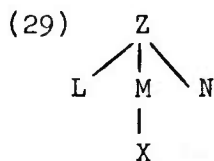
(vi) The use of square brackets to indicate features is always distinguishable from (v) since a subscript never accompanies a feature; e.g. [+DEF].

(vii) In the SI's of the T's, all variables are represented by X. If two X's are in the same SI, they need not be identical unless a condition so specifies.

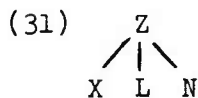
(viii) When the deletion operation takes place in a T upon the sole daughter of a node Y, the node Y is also deleted by convention. Thus, if (26) is converted to (27) by deletion, then (27) becomes (28) by convention:



(ix) If the sole daughter of a node Y is adjoined elsewhere in an SI, the fate of the node Y is presently an open question. Under one viewpoint it is also carried along in its dominant position. Thus if in (29) X is adjoined as left sister of L, then (30) is the resulting tree:

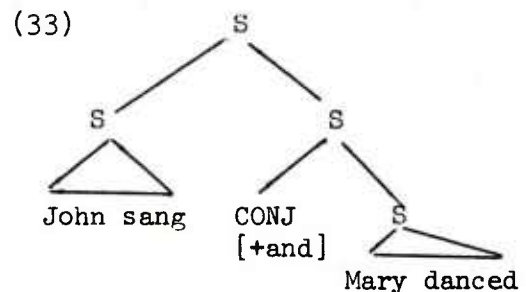
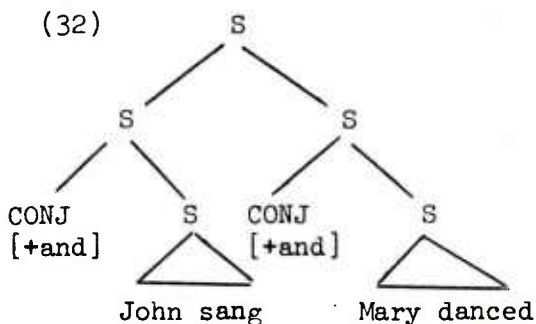


Under a second viewpoint, only the daughter is adjoined, the node Y being left behind and deleted by convention (viii). Thus (29) would become (31):



It is not readily ascertainable if this indecision has any serious consequences.

(x) An S-Pruning convention is necessary to ensure the deletion of S's which dominate only a single node in a derived structure. By this convention (32) becomes (33) after INITIAL CONJ DELETION has operated:



The one notable exception to this convention is the retention of the highest S (as in the case of IMP Subject Deletion).



### 3. The X-Bar Convention

Chomsky (1968) proposed an X-Bar convention to capture the relationship between NP and S. As noted above, we adopt that convention in principle and modify it with a case grammar merger. The convention looks as follows for the UESP grammar:

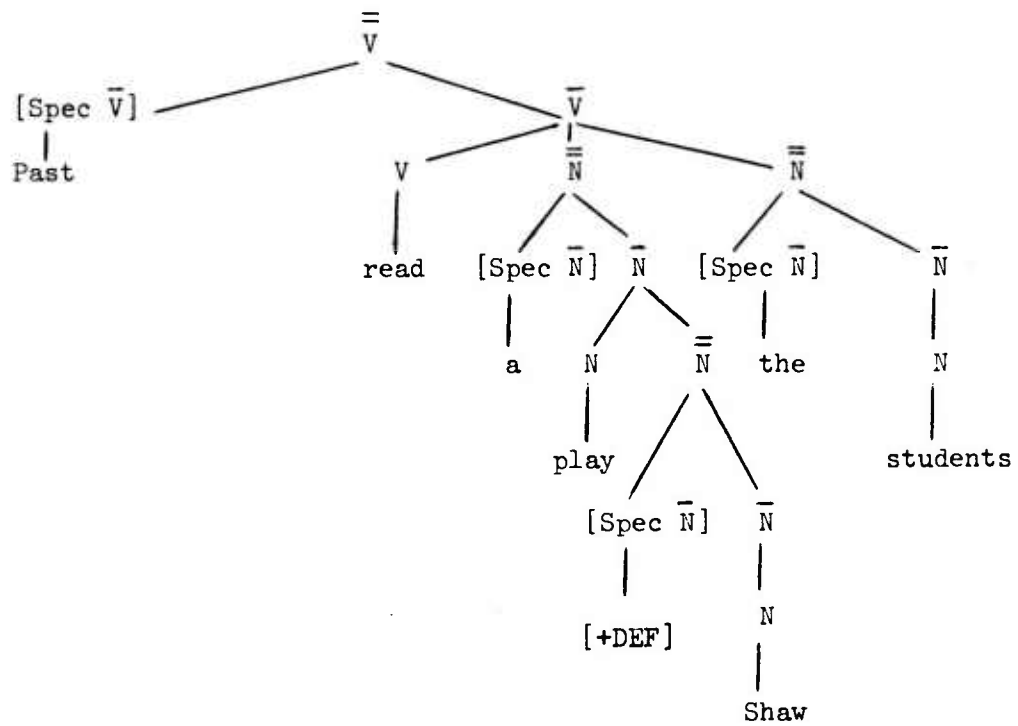
- (34) a.  $\bar{\bar{X}} = [\text{Spec } \bar{X}] \bar{X}$   
 b.  $\bar{X} = X \bar{N} \bar{N} \dots$
- (35) a.  $\bar{\bar{N}} = [\text{Spec } \bar{N}] \bar{N} \left( \begin{array}{l} \text{NP} = D \text{ NOM} \\ \text{or} \\ \text{NOM} = N \text{ NP NP } \dots \end{array} \right)$   
 b.  $\bar{N} = N \bar{N} \bar{N} \dots \left( \begin{array}{l} \text{or} \\ \text{PROP} = V \text{ NP NP } \dots \end{array} \right)$
- (36) a.  $\bar{\bar{V}} = [\text{Spec } \bar{V}] \bar{V} \left( \begin{array}{l} \text{S} = \text{MOD PROP} \\ \text{or} \\ \text{PROP} = V \text{ NP NP } \dots \end{array} \right)$   
 b.  $\bar{V} = V \bar{N} \bar{N} \dots \left( \begin{array}{l} \text{or} \\ \text{PROP} = V \text{ NP NP } \dots \end{array} \right)$

To tabularize even further:

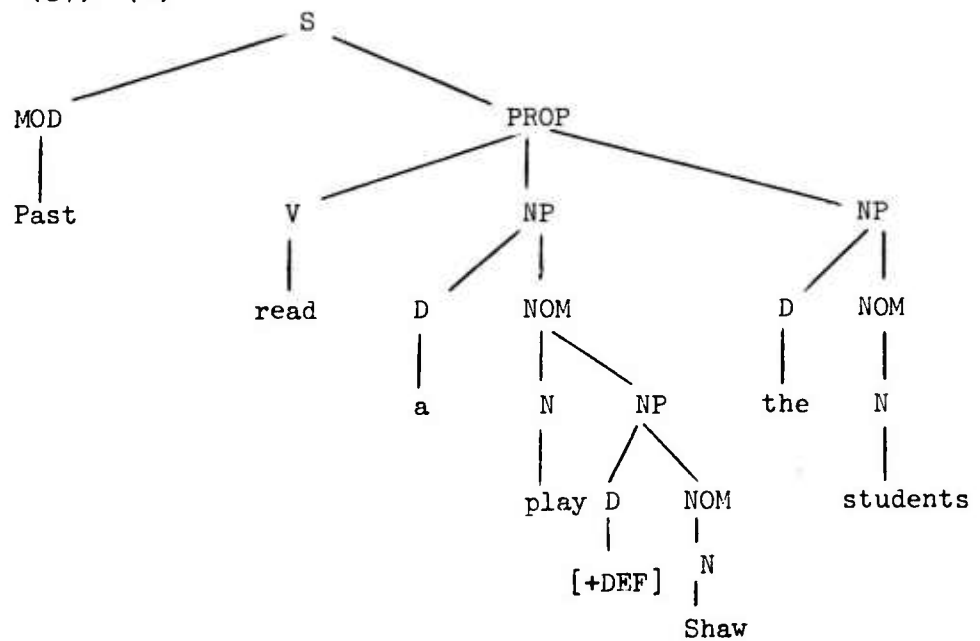
- (37) a.  $\bar{\bar{X}} = S, NP$   
 b.  $\bar{X} = \text{PROP}, \text{NOM}$   
 c.  $X = V, N$   
 d.  $[\text{Spec } \bar{X}] = \text{MOD}, D$

The following trees illustrate these conventions. Tree (37.a) is labelled with the X-Bar notation, tree (37.b) is a translation of (37.a) into our equivalent categories, and tree (37.c) is the same filled out to conform in detail with our base rules. The sentence for which these trees provide a deep structure is "The students read a play by Shaw."

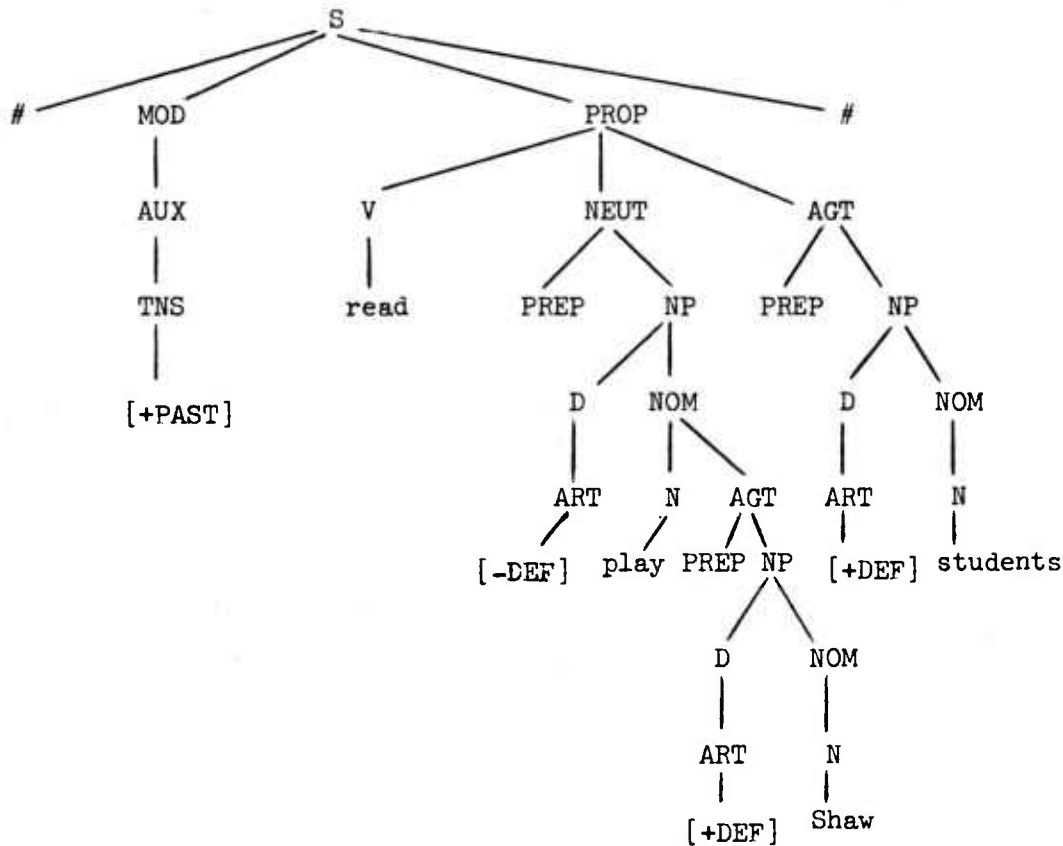
(37) (a)



(37) (b)



(37) (c)



#### E. Schemata

Schemata differ from T rules in various ways. First, schemata have structure building powers we have denied to T rules (except for Chomsky-adjunction). For example, the CONJ section contains several schemata which not only add new nodes but build whole new trees to replace old ones.

Second, and more fundamentally, schemata involve variables over SI's in a way that amounts to abbreviating in one statement a large (possibly infinite) number of transformational rules. Thus, for instance, the schema for Derived And-conj refers to an arbitrary string of identically labelled nodes  $A_1...A_n$  meeting a number of conditions. Here  $A_1$  is a variable for any single node; A is not a symbol of the grammar. Thus  $A_1...A_n$  abbreviates an infinite

set which includes, among others, NP NP, NP NP NP, ..., V V, V V V, ... Further, one of the conditions (Cond. (e)) is that "the members of {B} or the members of {C} are identical with respect to their highest proper analyses"; this statement is, in effect, an abbreviation for a probably infinite number of statements of particular proper analyses.

Schane (1966) has argued for the necessity of schemata rather than ordinary T-rules for conjunction, and most treatments of conjunction starting with that in Chomsky (1957) have at least implicitly used schemata. We have made as little use as possible of schemata elsewhere.

#### F. Features

Selectional features (those contextual features stated in terms of other features, e.g. [+\_\_ [+HUMAN]]) have only marginally been included in this grammar. Those which pertain to the features HUMAN, MASC., etc. have been considered part of the semantic component.

McCawley (1966) has argued effectively that selectional features must not only be semantic, but must be on NP's rather than on N's. Both conclusions follow from the observation that (38) and (39) below appear to exhibit the same kind of selectional violation:

(38) \*His virile classmate is buxom. [McC. (23)]

(39) \*That boy is buxom.

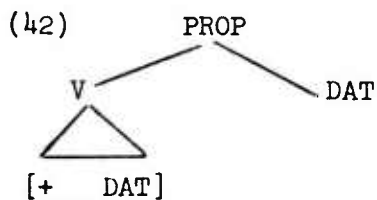
Assuming that buxom is indeed constrained against occurring with males, the problem is that classmate by itself can be either + or - male, and only by semantic amalgamation rules can the whole NP his virile classmate be determined to be +male. We are, in effect, saying that sentences like (38), (39) and (40) are grammatical but semantically deviant.

(40) John humiliated the rock.

Other features (e.g. +[[-ABSTRACT] OBJ], which equals [+\_\_ NEUT [Np[-ABSTR]]) are formally selectional but included in our grammar. Thus, our grammar claims that sentences like (41) are ungrammatical:

(41) \*John broke the sincerity.

Subcategorial features (those contextual features stated in terms of surrounding categories such as [+\_\_DAT] ) have been widely employed. The principle of strictly local subcategorization has been held to as much as possible, i.e. the symbols relevant to the item being inserted are immediately dominated by the node dominating the node under which the item is inserted. Example (42) meets this condition:



As an abbreviatory device, some subcategorial features have been abbreviated so as to look like intrinsic features. For example, [+S] is a short notation for the feature [+\_\_NEUT [ NP [S]]].

Intrinsic features are present on all lexical items. Thus, articles are characterized by the following intrinsic features among others: [+ART, +DEF, +DEMONS,...] There are also intrinsic features whose only function is to trigger or block specific T's. These are known as rule features. The feature [TO-DEL] is an example.

Features are for the most part associated with lexical items and hence with lexical categories. We have also recognized the necessity of associating features with non-lexical nodes. Thus, in CONJ, the feature [+SET] has been attached to NP's. This is a rather isolated instance, however, and we merely note the possible expansion of the feature system in this direction (particularly in the matter of selectional features).

September 1968





## BASE RULES

### 1. Caveat for the Phrase Structure Rules

There are some structures which have not been provided for at all in the PS rules. First, some adverbials fall into this abyss. The case grammar does include some Prep Phrases as cases which have previously been called adverbials (e.g. LOC, INS). No doubt others of this sort could be added for some dialects (e.g. BEN-"I bought Mary the purse" ?"Mary was bought the purse"). However, other adverbs are not suitable to inclusion as cases. Their placement under ADV nodes is by no means clear. Decisions as to (1) how many ADV nodes would be required, (2) where these nodes would be introduced, (3) what their constituent structure would be, and (4) how various types of adverbs would be restricted to particular ADV nodes, would all rest upon very shaky evidence. We opt thus to admit only one ADV node as a palliative remedy to the problem. It is our attempt to deal with a very limited part of a problem which requires total solution for any part of it to be "correct". (Cf. Note (b) under Rule 2)

There are a number of adverbs which we make no attempt to handle. Among them are those which follow:

(1) Discourse (sentence connecting) adverbs, e.g. "adversatives"--however, still, yet, conversely, rather, nevertheless, meanwhile, etc.; "causal"--for; "illatives"--therefore, so, then, thus, consequently, hence, accordingly, etc.

(2) Multiple position adverbs such as only, even, just, also, etc. If a single source is assumed, whenever these items are introduced, an attachment T (not formulated in the UESP grammar) must provide correct placement and semantic interpretation must rest on the surface structure (Identical statements can be made about EMPH).

(3) Sentence Adverbs which could conceivably be derived from higher S's, e.g. probably, certainly, etc.

(4) Subordinating conjunctions, e.g. although, if, since, even though, etc.

(5) The adverbs which occur in nominalizations, e.g. his departure yesterday; his playing the trumpet in the orchestra. Under the lexicalist position, these adverbs would require a special node under NP.

(6) Adverbs of manner, e.g. Harry lifted the suitcase quite awkwardly/in an awkward manner; Ruth dropped off to sleep very quickly.

(7) Adverbs of degree, e.g. Ralph likes Esther very much; Sam is very much (of) a man; Bill is very tall; How much does Wilhelm know?

(8) Comparatives. It is likely that comparative structures should be considered a type of adverb of degree. We believe that Doherty and Schwartz's (1968) analysis is essentially correct and that it could be incorporated into the present grammar with further formalization of the adverb section.

(9) Superlatives also remain an untouched area.

A second item sometimes incorporated into the PS rules, the EMPH morpheme, has been omitted here since it requires a presently unformulated attachment T and surface structure semantic interpretation.

## 2. Base Rules and Comments

RULE 1:

$$S \rightarrow \# \left\{ \begin{array}{l} \text{CONJ } S \ S \ (S)^* \\ \text{MOD } \text{PROP} \end{array} \right\} \#$$

(a) The similarities of sentence and NP structures have been captured by the X-Bar convention (Cf. GEN INTRO and Chomsky, 1968). Since that is presented separately, we give here the PS rules as normally employed.

(b) Junctures (#) are employed in stating SC's in some T's. They provide a means by which elements may be moved easily to sentence initial and final position (e.g. WH-fronting and Extra-position). They also serve as a blocking symbol for P-markers which are not well-formed, i.e., if they are not erased or replaced, the tree is thrown out.

(c) CONJ may be filled in (in the first lookup) by any of four items having the feature [+CONJ], viz., [+AND], [+BUT], [+OR], [+WH, +OR]. The latter is responsible for interrogatives and indirect questions. If [+WH OR] is dominated by only a single S, alternative interrogatives are generated. A subclass of these reduces to Y/N questions. If [+WH OR] is embedded (i.e. if more than one S dominates it), its surface representation is whether.

(d) Following Lakoff and Peters (1966) a rule of CONJ-spreading distributes the CONJ to the following S's. (Cf. CONJ)

(e) The iteration symbol (\*) is employed to generate the indefinite number of conjoined S's permissible.

(f) The symbols MOD and PROP have been chosen following Fillmore (1966a).

RULE 2: MOD → (NEG) AUX (ADV)

(a) The introduction of NEG in a single position follows Klima (1964); the choice of the position is discussed in NEG. Only one NEG is allowed per simplex S; double negation has not been provided for.

(b) There are various T rules pertaining to adverbs which are tied closely to other parts of the UESP Grammar. E.g., in NEG, S-INIT. ADV. PLACEMENT, PRE-VERBAL ADV PLACEMENT, AUX-ATTRACTION. We have included those T rules although we do not have a well-motivated source of the adverbs in the PS rules. The above node ADV simply provides a source for those adverbs that the T rules mentioned, deal with.

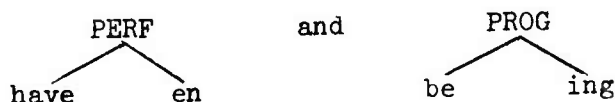
(c) In re: other items often times included under PRE: we have noted above that Q is triggered by [+WH OR] under CONJ; IMP is triggered within AUX; EMPH which is realized intonationally is not dealt with; and EMPH which is realized by clefting does not involve a trigger. (Cf. CLEFT)

RULE 3: AUX → { SJC (M) } (PERF) (PROG)

(a) The SJC morpheme has the lexical features [+MODAL, +AFFIX]. Thus, SJC functions as a modal with respect to certain rules (e.g. AUX-attraction) and as an affix with respect to others (e.g. DO-support).

(b) In the first lexical lookup, TNS is filled in by one of two possible entries distinguished by [+PAST].

(c) PERF and PROG are entered in the first lexicon as



respectively.

RULE 4: PROP  $\rightarrow$  V (ESS) (NEUT) (DAT) (LOC) (INS) (AGT)

(a) V has two basic kinds of lexical items inserted under it: verbs [+V, -A] and adjectives [+V, +A]. In re: adjectives as verbs see CASE PLACE and Lakoff (1965).

(b) Each V has a case frame associated with it in the lexicon. I.e., each verb is subcategorized with respect to the cases which follow it.

(c) The copulative BE arises in two different ways. It is transformationally inserted when adjectives are the head of PROP. It is also lexically inserted as a member of V when ESS occurs.

(d) Verbs like feel, seem, become, etc., represent an unsolved problem with predicate adjectives (e.g. "John seems afraid") since no source is provided.

(e) Various T's operate on the cases following V, positioning them correctly and assuring the correct prepositional markers. (Cf. CASE PLACE)

(f) Although all of the cases mentioned above can indirectly dominate S's, our rules are so devised as to make this a live option only for ESS and NEUT. I.e. complements and nominalizations arise only from S's dominated by ESS and NEUT.

(g) ESS(IVE) is the case employed for predicate nominals. It is the case dominating a good teacher in "That man is a good teacher." Likewise, it dominates by Chomsky in "That book is by Chomsky" since the underlying structure proposed contains "the book is [a book by Chomsky]<sub>ESS</sub>".

Although not explored to any depth, ESS might also be the source for existentials, i.e., the existential BE may take only ESS. This structure would optionally trigger the there subject placement T (not included in the UESP Grammar) if the ESS ART is [+GEN].

(h) There are some non-well-formed copulative sentences which must be ruled out though permitted by this PS rule. First, special restrictions on ESS NP's (e.g. ART's, RREL's, agreement) are considered in DET. Second, THAT-S nominalizations apparently can not occur on both sides of the copulative BE in the same sentence. Viz., "That he's gone is obvious" and "The difficulty is that John already left" but not "\*That there were no clues on the scene of the crime was that the murderer had escaped without a trace." (Cf. NOM)

(i) Verb complements come entirely from NP's. (Cf. NOM)

RULE 5: (parts (a)-(g):   ESS →   PREP   NP  
  [+ESS]   [+ESS]  
  
                                  NEUT →   PREP   NP  
  [+NEUT]   [+NEUT]  
  
                                  DAT →   PREP   NP  
  [+DAT]   [+DAT]

etc. for LOC, INS, AGT, PART

(a) PART(itive) is not properly a case (see RULE 8), but it has a similar internal structure and is therefore included here. It might be preferable to introduce NP in place of PART and try to formulate a general of-insertion rule of which partitives would be a special subcase.

(b) The process of specifying PREP's under different cases is dealt with in detail in the CASE PLACE.

RULE 6:

$$NP \rightarrow \left\{ \begin{array}{cc} S & \\ D & NOM \end{array} \right\}$$

(a) Phrasal conjunction is excluded in the UESP Grammar although a hard core residue of unresolved problems is recognized. (Cf. CONJ for justification)

(b) Cycling of T rules applies to both S's and NP's. However, rather than define a "lowest NP" by some boundary symbol (as is done with S), the application of the cycle to NP's is triggered by a dominance convention. (Cf. the TRANS RULES for discussion)

(c) S is provided for complementation and nominalization. As noted above, only ESS and NEUT are the sources of such embeddings. (Cf. NOM)

RULE 7:

$$\text{NOM} \rightarrow \left\{ \begin{array}{l} \text{NOM} \quad \text{S} \\ \text{N} \quad (\text{NEUT}) \quad (\text{DAT}) \quad (\text{LOC}) \quad (\text{INS}) \quad (\text{AGT}) \end{array} \right\}$$

(a)  $\text{NOM} \rightarrow \text{NOM S}$  is a recursive rule which if reapplied allows a series of restrictive relative clauses to stack up. If the S of  $\text{NOM S}$  is rewritten with the  $\text{CONJ S S}$  rule, a second source of a string of relative clauses is obtained. Thus, two sources, stacking and conjunction, have been allowed for multiple restrictive relative clauses.

(b) The use of  $\text{NOM}$  and the  $\text{NOM S}$  analysis is to some extent an arbitrary choice.  $\text{REL}$  presents the pro's and con's of this as well as the  $\text{ART S}$  and  $\text{NP S}$  analyses.

(c) Non-restrictive relatives (appositives) are not provided for by this rule. Although they are not discussed in this grammar, it is our general opinion that they should come from conjoined sentences. It is possible however that the  $\text{ESS}$  case might be employed after  $\text{N}$  as a source for some appositives.

(d) There is a disparity between  $\text{PROP}$  and  $\text{NOM}$  in that  $\text{ESS}$  occurs only under  $\text{PROP}$ .

(e) The parallelism of case structures in  $\text{PROP}$  and  $\text{NOM}$  provides a natural basis for an expansion of the lexicalist hypothesis (Cf.  $\text{GEN INTRO}$ ). Thus, "derived nominals" like John's proposal of marriage to Mary under the present analysis come directly from  $\text{NOM}$  and accompanying cases. For example,  $\text{N}[\text{proposal}] \text{NEUT}[\text{of marriage}] \text{DAT}[\text{to Mary}] \text{AGT}[\text{by John}]$ . Similarly, the ing-of constructions are not nominalizations but case structure. Note the naturalness of semantic relations with this analysis: the bleating [of the sheep]<sub>AGT</sub> vs. the frightening [of the sheep]<sub>DAT</sub>. (The of's in these examples do not all have the same source: see  $\text{CASE PLACE}$ .)

RULE 8:  $\text{D} \rightarrow \text{ART} \quad (\text{POST} \quad (\text{PART}) \quad )$

(a)  $\text{ART}$  is a terminal symbol whose lexical items almost without exception are found in both the first and second lexicons. Thus, on the first lexical lookup a complex of syntactic and semantic features are inserted. On the second lexical lookup the phonological features are inserted.

(b)  $\text{POST}$  includes those items which are in many previous analyses called pre-articles.



(c) PART(itive) is the source of the partitive construction of the boys in many of the boys. That is, many of the boys comes from many boys of the boys. For justification of this particular source see DET.

RULE 9: POST → (ORD) (QUANT) (CHIEF)

(a) Since all rewrites are optional, by convention at least one must be chosen.

(b) ORD(inal) includes first, second, ... next, last, ?only and possibly some superlatives such as least.

(c) QUANT(ifier) is the source of few, some, several, many, ..., the cardinal numbers (one, two, ...), and a few words uniquely marked [+DIST], viz., all, each, either, every, and any. This disallows \*the first each boy but allows the first few/two boys and each boy since [+DIST] QUANT's can not follow ORD's.

(d) CHIEF includes main, chief, principal, poor, old, upper, lower, inner, outer, ... and is in general a source for non-predicative adjectives.

September 1968

## CASE PLACEMENT

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## CASE PLACEMENT

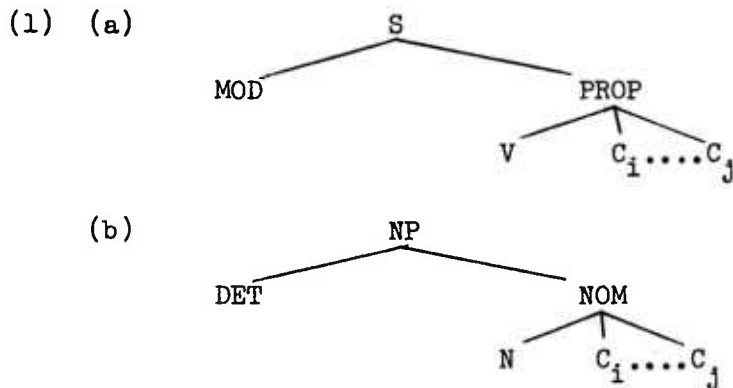
### I. BIBLIOGRAPHY

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### II. INTRODUCTION

#### A. Aims of Case Placement Rules

Since the UESP grammar posits the deep structure of sentences as being of the form (1.a), and that of noun phrases as (1.b),



where  $C_1...C_j$  are CASE NODES dominating PREP NP, rules must be provided to map such P-Markers onto P-Markers containing surface subjects (with S) and optional genitives (with NP), and containing a variety of surface complement relations. It is not unlikely that these rules are somehow akin to rules that provide for such notions as TOPICALIZATION and FOCUS MARKING, but those notions in turn are related to emphasis and stress marking in complex ways that have not been adequately studied.

If the lexicalist hypothesis is well motivated, it should be true that the rules of case placement, with approximately equal ease and without an excessive number of constraints that apply only to one class or the other, derive genitive constructions with nouns and subjects with verbs, and assign appropriate prepositions to the other complements of the head item.

If the deep case hypothesis is well motivated, it should be true that the rules of case placement generate a number of ambiguous surface structures at any point where contrastive deep case markers are obliterated by these rules.

Though neither condition just stated is sufficient to validate the hypothesis, both are necessary: and both are met reasonably well, it turns out.

For our purposes, therefore, the CASE PLACE rules map semantically interpretable deep structures, in which semantic notions like AGENT and INSTRUMENT are explicitly marked, onto surface structures in which such notions are often unmarked or ambiguous, structures which closely resemble, for sentences, the deep P-Markers of Chomsky's Aspects (1965). But it seems clear that since pairs of sentences with the same deep structure, like (2),

- (2) (a) He aimed the gun at Mary.
- (b) He aimed at Mary with the gun.
- (c) He loaded the truck with hay.
- (d) He loaded hay on the truck.

do not have quite the same semantic reading, either an analysis which relates them in this way is fundamentally wrong, or else both the deep structure and some later level of structure (possibly surface) play a role in semantic interpretation; or alternatively it might be claimed that certain transformations themselves must be computed in arriving at a semantic reading. The UESP grammar has no decisive evidence to present on these alternatives; the rules are constructed as if it were true that the subtle semantic difference between (2.a) and (2.b), or (2.c) and (2.d), did not depend on deep structure, whether that is in fact true or not.

## B. Prepositions as Case-Markers

A grammar which proposes that every actant is marked by some preposition in the deep structure must provide an account of the selection of the particular prepositions that characteristically appear on the surface with the various actants. In a grammar that lists a number of optional PREP-PHRASE nodes (as in Chomsky 1965), there is no basis for claiming that some prepositions are "natural" (i.e. unmarked) in the representation of a particular relation to the head, but that others have to be specially marked. In a case grammar the converse assumption is made, namely that for each possible actant there is some unmarked preposition, and that any other preposition with that actant must be lexically marked.

Put another way, a central claim of case grammar is that one can distinguish (and that there are syntactic consequences of doing so) between those prepositions that mark one of a small set of highly general relations between heads and complements — i.e. the case-markers of a small closed system of partially covert, partially overt case relationships — and those prepositions that are independent semantic primitives in one or more of the possible sets of logical, spacial, temporal, social, etc. relationships to which linguistic reference can be made. The distinction is in part "internally referring" vs. "externally referring"; that is, we can show what

the preposition after means by correlating it externally with a set of relations between events in the real world; but we cannot show what of means in phrases like his loss of the privilege except in terms of the language-internal notion "object".

The lack of external or primarily referential significance of prepositions which function to mark internal case relationships is clearest when there is a cognate phrase or sentence where the relationship is marked only by the configuration or sequencing of the words:

- (3) (a) Someone opened the door with the key.  
      (a') The key opened the door.
- (b) The clown was amusing to the children.  
      (b') The clown amused the children.
- (c) He loaded hay on the truck.  
      (c') He loaded the truck with hay.
- (d) The door opened.  
      (d') The opening of the door...

In (3.a,b,c,d) we wish to say that the prepositions mark the cases INS (with), DAT (to), LOC (on, in this instance), NEUT (of), and that the prepositions which mark cases do not bear any other (i.e. "external") semantic content.

### C. General Questions about Prepositions and Case

There are at least three general questions about this proposal that can be answered at best rather diffidently, as of this time: (1) What are the motivations for claiming that some instances of prepositions mark internal case relationships rather than referentially external relationships? (2) How many such purely internal relationships must be recognized, and at what level of conviction for each? (3) Whenever the surface correlation between a small set of prepositions and deep cases breaks down, i.e. when a particular instance of a case is marked by a preposition that is in some sense atypical or unnatural, what is the price of capturing this deviation?

We have considered the first question in GEN INTRO and GENITIVE, particularly. The second question has not really been seriously considered in this grammar, since it is intimately tied to general questions of the number and structure of adverbs; and the full range of adverbial constructions has been so little investigated that we excluded it from our domain of study here. The third question is central to the case placement rules, since the prepositional marking



of a given case is subject to two kinds of variation, discussed below.

#### D. Variation in Prepositional Case-Marking

##### 1. Variation that is Controlled by the Head of the Phrase

We believe that the grammatical relation between verb and NP is the same in all the examples of (4):

- (4) (a) He laughed at her behaviour.
- (b) He insisted on the answer.
- (c) He puzzled over the problem.
- (d) He referred to the solution.
- (e) He considered (  ) the question.

The relation is that which holds between a verb and its object; the prepositions at/on/over/to and the absence of any preposition in (4.e) must be somehow equivalent. This equivalence is captured by setting up a distinction between natural or unmarked prepositions for each case, and aberrant or marked prepositions as properties of particular (exceptional) heads.

##### 2. Variation that is Controlled by Transformational Rules

Within each group in (5) we believe the case relationships are essentially constant:

- (5) (a) Her behavior was annoying to him.  
Her behavior annoyed him.  
He was annoyed at her behavior.
- (b) He aimed at her with the gun.  
He aimed the gun at her  
His aiming of the gun at her...
- (c) They loaded hay on the truck.  
They loaded the truck with hay.

But since the prepositional marking of the constant relationships varies, depending on what item is subject or object, or whether there is nominalization or not, the rules must provide a means of holding the relationships constant while varying the prepositions (or deleting them) in regular and general ways.

#### E. Substance vs. Mechanics in Case Placement

It turns out to be virtually impossible at this time to motivate, satisfactorily, one way rather than another of setting up all the mechanics of the Case Placement rules. We therefore try to distinguish between those aspects of the rules which make substantive claims and those aspects that are merely devices of convenience which

cannot be particularly defended in comparison with numerous alternatives.

Some of the substantive claims embodied in these rules are the following:

(a) That some prepositions are "real" (referential, meaning-bearing, lexically inserted) while others are not; the most striking syntactic evidence of this is the behavior of the two classes with sentential objects, developed in III.A below.

(b) That certain prepositions are appropriate to certain cases, and others must be considered aberrant and therefore marked lexically as exceptions.

(c) That some classes of real prepositions, in particular the locative ones, are related to various head verbs/noun in such a way that a certain one for a given head may be deleted without semantic loss. This deletable preposition is taken to be the unmarked instantiation of the locative relation with that head.

In the development of the analysis we shall take pains to distinguish between complexity in the formulation that seems to have a substantive basis, and complexity that is attributable rather to some artifact in the general theory or in this particular implementation of it.

### III. DETAILS OF THE ANALYSIS

#### A. Prepositions in Relation to Gerundivization

The rule of gerundivization GER is one of the earliest in the grammar (see NOM and RULE ORDER): in fact we know of no rule that must precede it. As it is formulated in NOM, it is triggered either by a rule feature, as with verbs like avoid, or by a preposition, as in a sentence like He did it without knowing why.

##### 1. Sentential Objects of Prepositions

Consider now the kinds of sentential objects that appear with prepositions. They are of three types:

(a) Regular finite verb constructions (corresponding to PREP-N-REL), but with gerundive reduction disallowed:

- (6) (a) After the show,...
- After the show was over,...
- After the time at which the show was over,...
- \*After the show's being over,...

- (b) \*When the show,...
- When the show was over,...
- At the time { when } the show was over,...
- {at which}
- \*When the show's being over,...
- 
- (c) \*While the show,...
- During the show,...
- While the show was on,...
- During the time { at which } the show was on,...
- { when }
- \*While the show's being on,...

(b) Gerundives without expressed subjects:

- (7) (a) While (\*her) reading the book, I had an idea.
- (b) When (\*her) reading books, I have ideas.
- (c) After (\*her) reading the book, I had an idea.
- (d) By (\*her) reading books, I get ideas.
- \*By (that) I read books, I get ideas.
- (e) On (\*her) reading that book, I got an idea.
- \*On (that) I read that book, I got an idea.
- (f) Without (\*her) working harder, I won't succeed.

(c) Gerundives with or without expressed subjects, factive:

- (8) (a) Between his hammering in the garage and her running the washing machine, I can't get a thing done.
- Between working in the garage and running the washing machine, I can't get a thing done.
- \*Between (that) he hammers in the garage and (that) she runs the washing machine, I can't get a thing done.
- Between the fact that he hammers in the garage and the fact that she runs the washing machine, I can't get a thing done.
- Between the fact of his hammering...and of her running...
- (b) Except for (his) having read Shakespeare, he would be ignorant.
- Except for the fact of (his) having read...
- Except for the fact that he has read,...
- Except that he has read,...

- (c) In spite of (his) buying all the stock, he is not wealthy.

In spite of the fact of (his) buying,...

In spite of the fact that he bought,...

\*In spite of that he bought,...

- (d) He is ashamed of (my) having bought the stock.

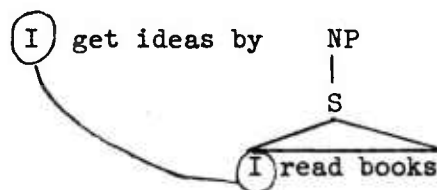
He is ashamed of the fact of (my) having bought the stock.

He is ashamed that  $\left\{ \begin{matrix} I \\ he \end{matrix} \right\}$  bought the stock.

He is ashamed of the fact that  $\left\{ \begin{matrix} I \\ he \end{matrix} \right\}$  bought the stock.

Type (a), as in examples (6.a,b,c) clearly must be analyzed either as non-prepositional (i.e. after, when, while must be taken as representatives of another category, conjunction), or as containing dummy nouns with relative clauses (as proposed in Katz and Postal 1964). Either way, the question of sentential from when governed by PREP is irrelevant. Type (c), as in examples (8.a,b,c,d), is clearly factive (see NOM); factive examples say nothing about the relation of gerundivization to the preposition because the head item fact is sufficient to permit gerundivization; but a striking constraint on the form of sentences after prepositions appears from the ungrammaticality of (8.a.iii) and (8.c.iv), namely that only gerundive form is permitted when the head noun fact is deleted. Sentence (8.b.iv) is an exception to this, and it suggests that except is not itself a preposition.

Type (b) is the revealing type: there is no grammatical example without equi-NP-deletion among these examples. Now, equi-NP-deletion is surely a rule or principle of some kind which operates between higher and lower sentences; e.g. (7.d)



We must block structures like (7) which do not have the identity necessary for equi-NP-deletion, and it is clearly necessary to assign structure to (7) which will guarantee that equi-NP-deletion is mandatory when identity exists. But EQUI-NP-DEL is a governed rule. Since the string after the comma in the examples of (7) can be virtually anything whatever and therefore need not contain the

item that governs EQUI-NP-DEL in the gerundive, it must be that the preposition governs it; and there is also no other possible item to explain why the form is gerundive, in non-factive examples; the conclusion is that a preposition requires, as the only possible form of a sentential object, a subjectless gerundive. Any apparent exception to this requires explanation.

## 2. Apparent Exceptions to Subjectless Gerundives as Prepositional Objects

Consider, then, the apparent exceptions. They are of two types: (a) those in which there is a deep structure factive that determines gerundivization; and (b) those which argue for the view that certain prepositions are not really present at the time of gerundivization — i.e. those which provide a justification, given the rest of this rather complex argument, for the view that prepositions are, so to speak, either "real" or "unreal", referential or case-marking, — and only the former govern gerundivization.

a. Factive

The factives were previewed in example (8) above. They constitute an extensive class of apparent exceptions. Fully discussed in NOM, it is necessary here to indicate only the outlines of gerundive derivation in factive examples:

- (9) (a) He regretted the fact that she took sick.  
 (b) He regretted the fact of her {taking  
   having taken} sick.  
       [From (a) by FACT-GER rule]  
 (c) He regretted that she took sick. [From (a) by FACT-  
       DEL rule]  
 (d) He regretted her {taking  
   having taken} sick. [From (b) by  
       FACT-DEL rule]

That is, all factive predicates (including the prepositions of example (8)) permit gerundivization of a sentential object. The factive verbs (as in (9)) pose no exceptions to the claim that subjectless gerundives are the only possible form of sentential objects of prepositions; but many factive adjectives and nouns are linked to their factive objects by of or (rarely) other prepositions, and they permit subjects. They thus constitute a very large class of apparent exceptions:

- (10) (a)
- She is { proud  
envious  
cognizant  
aware  
ashamed  
confident  
certain } of (the fact of) his having been  
a war criminal.

(b) His dismissal was  $\left\{ \begin{array}{l} \text{indicative} \\ \text{independent} \end{array} \right\}$  of (the fact of) his having engaged in political activities.

(c) He was  $\left\{ \begin{array}{l} \text{amused at} \\ \text{angry at} \\ \text{amazed at} \\ \text{interested in} \end{array} \right\}$  (the fact of) her trying to seduce him.

The factives constitute, then, a clear class of exceptions which are not really exceptions, since at the time of gerundivization by the rule that applies to examples like (8), all of the factives are protected by an intervening node fact, and they undergo a different form of gerundivization by virtue of the presence of that node.

#### b. Case-Marking Prepositions

The other class of exceptions apparently needs to be made for a class of predicates in which gerundivization is optional. Consider first a verb of which the same fact is characteristic:

- (11) (a) He prefers (\*her) working.
- (b) He prefers to work.
- (c) He prefers that she work.
- (d) \*He<sub>i</sub> prefer that he<sub>i</sub> work.

(11.a) is governed by the feature [+GER]. The item prefer is marked [+/-GER] in the lexicon; if [-GER] is chosen, either (11.b) or (11.c) is the output, depending on whether the condition of coreferentiality for EQUI-NP-DEL is met, (11.b), or not, (11.c). (11.d) is the form that would emerge if EQUI-NP-DEL were not obligatory — i.e. (11.d) underlies (11.b).

So far, no problem arises since there is no preposition to block the derivation of (11.b) or (11.c) — recall our strong generalization that subjectless gerundivization is the only form permitted to the sentential object of a preposition: if there were a preposition, (11.d) would reduce to (11.a), and (11.b) and (11.c) would be impossible to generate, given this generalization.

Now consider a verb that has a marked preposition (aberrant, since verbs do not ordinarily mark "direct objects"/"neutral cases" with prepositions):



- (12) (a) John insisted on leaving.  
 (b) (?) John<sub>i</sub> insisted that he<sub>i</sub> leave.  
 (c) John insisted on her leaving.  
 (d) John insisted that she leave.

It is intuitively clear that (12.a) and (12.b), and (12.c) and (12.d), are paired in every respect. But if they are, then (12.b), (12.c), and (12.d) are flagrant violations of the principle in question: (12.b) because the underlying preposition on (deleted in the surface) should have required gerundivization; (12.c) because the principle disallows a subject with non-factive gerundivization; and (12.d) like (12.b).

Suppose, however, that on is only a case-marking preposition: i.e., insist is lexically marked with the feature [+NEUT PREP on], a feature which causes [+on] to be attached to the prepositional node dominated by NEUT. Since insist is marked [+/-S], (12.d) is normal output, granted a late rule that deletes any prepositional node before that-S, which is needed to relate (12.c) and (12.d). Since on is not at the time of gerundivization a real preposition — only a feature on the head verb — gerundivization can apply exactly as to prefer (11), and other such verbs by virtue of the fact that insist is, like them, marked [+/-GER].

Alternatively, one might save the cost of this feature by inserting the preposition on optionally provided that the realization of NEUT were sentential. This would require a feature of the following approximate form:

[+/-NEUT PREP on / NEUT[ NP [ S ] ] ]

That is, a rule-governing feature that not only names the rule but spells out part of the structure index of that rule. This is beyond the power that we have permitted our rule features in this grammar, since the others merely name a rule in which they apply. That is, a feature like this is considerably more powerful than one like [+GER] — which merely tags a rule, namely the rule GER — or a strict-subcategorical one like [+S], which merely states that a form can occur in the environment of a sentential object. This putative feature both tags a rule and specifies that the tag applies only if a certain strict-subcategorical condition is also met. The feature would permit the optional insertion of the preposition; if inserted, the output would be (12.a) or (12.c); if not, (12.b) or (12.d). There would of course be no need then for a rule to delete a prepositional node before that-S, since this context-sensitive feature would permit that-S only when no preposition had been inserted. This alternative is not merely notationally different from the one chosen here: it makes the substantive claim that all prepositions are "real" in that they all govern gerundivization; in terms of the

complexity of the mechanics it requires, it eliminates [+/-GER] from verbs like insist, at the cost of extending the power of feature notation to include a type of feature which we have otherwise not found necessary. But since we have no real contribution to make to the question of what the proper formal constraints on features and rules ought to be, the latter is not a serious consideration. The fact appears to be that under either alternative analysis the sentences (13) are related equally closely:

- (13) (a) He insisted on the answer.
- (b) He insisted on her answering.
- (c) He insisted that she answer.

Under the analysis we have chosen, all three have on to mark the NEUT object, and it is deleted in (13.c); gerundivization vs. that-S is determined under the lexical convention of obligatory specification for [+/-GER]. Under the alternative outlined above, the preposition on would be inserted obligatorily in (13.a), and under the convention of obligatory specification either that-S without preposition would be selected, or preposition with S would be selected and gerundivization would apply to all prepositional objects. The difference, then, is between insertion and non-insertion of the preposition. To choose between these alternatives one must find some construction in which both the preposition and the full sentential that-S are preserved. Finding this would convincingly demonstrate that the alternative we have chosen (with the preposition deleted by a late rule in He insisted that she answer) is preferable.

Such a construction exists in the so-called "pseudo-cleft" (see CLEFT):

- (14) (a) He insisted that she leave.
- (b) \*What he insisted was that she leave.
- (c) What he insisted on was that she leave.

But, there are some speakers who find (14.b) satisfactory. There are, however, examples with adjectives, of precisely parallel structure and derivation where the grammatical facts are unarguable.

- (15) (a) He is afraid that she will leave.
  - (b) He is afraid of her leaving.
  - (c) \*What he is afraid is that she will leave.
  - (d) What he is afraid of is that she will leave.
- (16) (a) He is desirous that she change her makeup.
  - (b) He is desirous of her changing her makeup.
  - (c) \*What he is desirous is that she change her makeup.
  - (d) What he is desirous of is that she change her makeup.

- (17) (a) He is keen that she should win the contest.
- (b) He is keen on her winning the contest.
- (c) \*What he is keen is that she should win the contest.
- (d) What he is keen on is that she should win the contest.

In these examples it is clear that pseudo-clefting cannot drop the preposition that marks the complement of the adjective. For some speakers, the same is true of pseudo-clefting with verb-prep constructs, but for others the dubious examples are all right:

- (18) (a) He agreed that she could go to Harvard.
- (b) He agreed to her going to Harvard.
- (c) (?) What he agreed was that she could go to Harvard.
- (d) What he agreed to was that she could go to Harvard.

Thus the crucial basis for decision between preposition-deletion in the examples (14.a) and (18.a), and non-insertion of the marked preposition, is tainted by dialect disagreement. But the fact that the derivation we have chosen makes (11) and (12) exactly parallel, combined with the fact that the pseudo-cleft argument is correct for some dialects and the fact that the formalism does not have to be further elaborated, convinces us that the present derivation is correct and that gerundivization with case-marking prepositions is not an exception to the general position that real prepositions take only subjectless gerundives as objects.

#### B. "Natural" Prepositions in Relation to Case Nodes

The assumption of this grammar is that for any given instance of an actant, there is some unmarked or "natural" preposition. Any other preposition with that actant must be lexically marked. We consider below what the natural preposition is for each of the five cases provided by the base rules of this grammar.

##### 1. Neutral Case

Any preposition that appears in the surface structure that derives from the node NEUT in the deep structure is either (1) a marked preposition, introduced by the rule PREP-SPREAD, as in (19):

- (19) (a) He convinced her of her error.
- (b) He deprived the prisoner of his rights.

or (b) it is a preposition transformationally inserted by a general rule that makes no reference to a particular case, as in (20):

- (20) (a) The arrival of the train...
- (b) The analysis of the equation...
- (c) An appraisal of the situation...

If a prepositional node dominated by NEUT in the deep structure is not filled out by either (a) or (b), it is deleted late in the rules.

The claim of the present grammar with respect to the Neutral case, then, is that it is not naturally marked by any preposition. This is in contrast with the assumption of Fillmore (1967) that of is the natural marker of the "objective" (= our NEUT) case. Of does in general mark the relationship to a head item which is in some sense most dependent on the meaning of the head item itself: i.e. of is the least discriminating preposition, semantically. But it comes into a structure from so many different sources (see Section III.c below) that there appears to be little to gain by considering one of those sources to be direct derivation from Neutral case in a way parallel to the derivation of to for Dative, by for Agentive, etc.

## 2. Dative Case

The unmarked preposition for Dative is taken to be to: that is, given a node DAT dominating a PREP, and given no further specification of the form of the PREP, it will turn out (in the Second Lexicon) to be to.

Some instances of marked prepositions with the Dative case are these:

- (21) (a) He asked a question of Mary.
- (b) He prevailed upon John to answer his question.

There is a close relation between Dative Case and Directional Adverbs which is not captured in the present analysis:

- (22) (a) John sold the house to Bill.
- (b) Bill bought the house from John.

In (22.a) to Bill would be analysed here as Dative. But in (22.b) from John would either be an instance of a case which we have not included (say, "Source") or it would be an adverb of some unexplored type. Yet there are several verb pairs which seem to embody the same to/from relationship: teach/learn, give/receive, lend/borrow. Perhaps all of them should be analyzed as taking Directional Adverbs with to/from (and appropriate switching between the alternate verbs and their subjects/objects). An alternative possibility would be to consider the "receiving" member of each pair as taking from as a marked preposition for Dative case. These remain unexplored problems for the present grammar.

## 3. Locative Case

With the Locative there is no single unmarked preposition: all locative prepositions have semantic content that includes more than the feature [+LOCATIVE], whereas the preposition to as Dative marker is claimed to be empty. Thus any locative preposition has to be looked up in the First Lexicon.



There is, however, a distinction between marked and unmarked locative prepositions. Consider verbs of the class load, smear, ... which occur in sentences like (23):

- (23) (a) He loaded/smeared the truck with mud.  
(b) He loaded/smeared mud on the truck.

If the truck in (23.a) is an underlying LOC, as it appears to be in (23.b), we should not permit (23.a) to be related, for example, to (23.c):

- (23) (c) He loaded/smeared mud under/over/beside/in/ throughout...the truck.

Clearly there is a single preposition — on, in (23.a) — which is somehow lost in the transition between the deep structure and the surface structure of (23.a), not just any one of the many prepositions that could occur in the LOC of (23.c).

On the basis of this deletability argument some single locative preposition is taken as the unmarked one for each head item (verb, noun, or adjective) which allows objectivalization of the locative NP and consequent deletion of the preposition. It is not clear just what the best mechanism to provide for this desired result is. Our device is a rule-governing feature  $[+_{\text{LOC}} \rightarrow \text{OBJ}]_{\text{P}_i}$  where  $[\text{P}_i]$  is some specified preposition that is deletable with that particular head item. This device is adequate to account for the facts outlined above; but there is a further set of observations that render the device wholly inadequate. Consider the locative phrases of (24):

- (24) (a) He loaded hay {on the truck.  
                                {in the cargo hold of the 707.}
- (b) He loaded {the truck  
                       {the cargo hold of the 707} } with hay.
- (c) He stays {at the hotel.  
                    {in the room. }
- (d) They got {on the bus.  
                    {in the car. }

(24.c,d) illustrate merely the fact that prepositional selection depends on a sort of intersection of both the verb that precedes the preposition and the object that follows it. It is not obvious how this is best stated even with adverbs in intransitive sentences like (24.c,d); in (24.a,b) we are dealing with a similar selection problem which here has the consequence that the "disappearing"

preposition -- i.e. the unmarked one, in the sense of (23) -- cannot be indicated as a feature on the head item at all, unless we could devise a way to indicate the semantic class of the appropriate object at the same time (e.g. in (25.a) the preposition is on with an open-top container, in with a closed container, or some comparable statement). We leave this problem open; the solution of it requires a device for stating selection restrictions across several categories simultaneously.

Overlooking the inadequacy of the interim solution provided by these rules, there is a further problem in determining which preposition is the marked one. The verb cross, for example, can be argued to have an unmarked LOC preposition over:

- (25) (a) He crossed the bridge/river.
- (b) He crossed over the bridge/river.

That is, (25.a) and (25.b) seem to be good paraphrases of each other. But if the verb cross is considered more closely, it appears to contain two notions: "move" and "across". Thus (26.a) is a paraphrase of (25.a):

- (26) (a) He went across the bridge/river.

One can further argue that "cross over" in (25.b) contains somewhat more than just the notions "move" and "across". Thus (26.b) is perhaps anomalous:

- (26) (b) He crossed over the Hudson River in the Holland Tunnel.

but (26.c) is normal:

- (26) (c) He crossed/went-across the Hudson River in the Holland Tunnel.

Such rather tenuous arguments suggest that the deletable preposition with cross is across, even though (26.d) is sufficiently infelicitous that one might argue that prepositions such as this one are obligatorily deletable:

- (26) (d) He crossed across the bridge/river.

#### 4. Instrumental Case

The unmarked preposition with the instrumental case, provided that the object is concrete, is taken to be with:

- (27) (a) He shot the criminal with a gun.
- (b) He flew the plane with a transmitter.



With abstract objects, other prepositions appear in phrases which in this grammar are considered to be instrumentals:

- (28) (a) He was amazed at her behavior.  
 (b) He is interested in studying architecture.

These are marked by a feature [+INS PREP P<sub>i</sub>] on the head item. This preposition-feature is spread onto the appropriate node by one of the early rules of the grammar (Section IV.A below). For justification of the view that sentences like (28) contain instrumentals at all see NOM.

#### 5. Agentive Case

The unmarked preposition is taken to be by. By is, however, also necessarily inserted by the passive rule, since not only deep structure agents are marked as surface agents:

- (29) (a) Mary received the package.  
           [DAT]  
 (b) Mary received the guest.  
           [ACT]  
 (c) The package/guest was received by Mary.

We do not claim, however, that by NP (in the agentive interpretation) derives only from the passive rule. Such a claim is reasonable enough for verbs, in view of the fact that the Active Subject Placement rule always moves an agentive, if there is one, into surface subject position: i.e. it can never remain behind, as it were, and so we don't get sentences like (30):

- (30) (a) \*The door opened by the janitor.  
       (b) \*The city destroyed by the enemy.

But with nouns heads, there is no obvious motivation to claim that nominals with by-phrases have undergone passivization unless the object has been moved to the front (genitivized):

- (31) (a) The opening of the door by the janitor...  
       (b) The destruction of the city by the enemy...  
           The city's destruction by the enemy...

In order to provide for the agentive-marking by in (31.a) and (31.b.i), where there is no independent justification for claiming that there has been passivization, we assume that the unmarked agentive preposition is by just as the unmarked dative is to and concrete instrumental is with.

C. "Unnatural" or "Aberrant" Prepositions in Relation to Case Nodes

As noted earlier, variation among prepositions to mark any given case relationship is of two types: that which is governed by the head and inserted directly from a lexical feature that appears with the head, and that which results more indirectly from the application of various transformations. We consider these two types of variation in more detail below.

1. Lexically Marked Prepositions

The examples of (4) are repeated below for convenience:

- (4) (a) He laughed at her behavior.
- (b) He insisted on the answer.
- (c) He puzzled over the solution.
- (d) He referred to the solution.

We take these all to be examples of aberrant prepositional marking of NEUT. We have seen other examples like (19),

- (19) (a) He convinced her of her error.
- (b) He deprived the prisoner of his rights.

where of marks a NEUT with a verb, which we take to be aberrant in view of the fact that objects in general are not prepositionally marked with verbs (He gave her the money, He hit her, He threw the ball, etc.). We have also seen instances of DAT marked by prepositions other than to:

- (21) (a) He asked a question of Mary.
- (b) He prevailed upon John to answer his question.

and instances of INS marked by prepositions other than with:

- (28) (a) He was amazed at her behavior.
- (b) He is interested in studying architecture.

We have no instances of AGT marked by any preposition other than by. LOC is peculiar in that the notion of marked/unmarked has to be defined somewhat differently: whatever preposition is deletable when objectivalized is taken as the natural locative for that head (and object, where that is relevant), and all others are taken as marking some non-implicit relationship -- i.e. as bearing a full semantic load like any other item entering the sentence from the First Lexicon.

The question is how these marked prepositions actually enter into structures under the rules proposed here. They are all marked by a feature of the following general form:

(32) [+C<sub>i</sub> PREP P<sub>j</sub>]

e.g., [+NEUT PREP on], [+DAT PREP of], [+INS PREP at]...

These features govern an early rule, PREP SPREAD, which takes the feature from the head and attaches it to the appropriate prepositional node. This feature is then used in the Second Lexicon to provide the phonological form of the marked preposition.

In general the lexically marked prepositions correspond to what Lees (1960) and others have called VERB-PREPS -- i.e., verb-plus-preposition functioning as a unit verb. The only evidence that they are units, other than some not-entirely-clear evidence from passivization, is precisely the intuition that the preposition that is required is not really that preposition in its ordinary relational sense. The prepositions generally (though with some exceptions that have to be lexically marked) remain constant as markers of the corresponding noun heads: laugh at/laughter at, insist on/insistence on, refer to/reference to, etc. They differ from particles with verbs in being non-separable and in several other respects most carefully studied by Fraser (1965). Particles are left without comment in this grammar because getting into them would involve the grammar in the explicitly excluded domain of adverbs.

The non-entirely-clear evidence from passivization is the fact for most speakers that the passives (33), where the preposition is part of a verb-prep unit, are better than those of (34), where the preposition is part of an adverb:

- (33) (a) The document was referred to frequently by the dean.
- (b) The retreat was insisted on by the general.
- (c) The problem was puzzled over by a whole generation of youth.
  
- (34) (a) \*America was traveled to by the Pilgrims.
- (b) \*The bed was slept on by Goldilocks.
- (c) \*The city was flown over by a squadron of P-38's.

The evidence is not clear, however, since the examples of (33) are considered ungrammatical, or at least marginal, by some speakers. Taking the evidence as viable, we have structured the rule that makes a surface structure object from some deep structure actant in such a way that the preposition of such verb-preps as those of (33) comes to be attached to the verb, which is not true of the prepositions of non-objectivalized actants such as a locative with an intransitive verb.

## 2. Prepositions neither Natural nor Marked

We consider now certain instances where the preposition that appears on the surface is neither the one that is to be expected on the basis of its deep case nor one which we have reason to mark as exceptional. We are concerned only with prepositions, meeting either of these negative conditions, which are still within the restricted case-frame of this grammar: i.e. prepositions in adverbs (temporal, manner, means, etc) which are outside the case-frame (or perhaps within it but not dealt with here) are not now under discussion.

### a. The Rule of OF-INSERT

Given these restrictions, it turns out that we are really discussing instances of the preposition of which are not already explained by naturalness or marking. Consider the following examples:

- (35) (a) The performance amazed the child.  
 (b) The performance was amazing to the child.  
 (c) The amazement of the child at the performance.

If we assume that the child is DAT in all three, how are we to account for the prepositional node being represented as  $\emptyset$ , to, and of? In (35.a) it seems clear and paradigmatic that objectivalization has occurred, and that this process always erases unmarked prepositions (though it retains marked ones, such as on in insist on). In (35.b), with an adjective head, it seems again clear and paradigmatic that there has been no objectivalization (that process being blocked with adjective heads, since there is no possibility of passivization), and the deep case preposition shows up as to, correctly. In (35.c) we have a violation of the paradigm established so far: we have of with a dative, and no basis for calling it a marked preposition since it is unmarked with the corresponding adjective amazing. Furthermore, this one is representative of a large class: amuse, annoy, interest, irritate, stimulate,... But in (35.a) we note that the preposition was erased by the objectivalization rule with the verb; if we let the objectivalization rule apply to nouns in precisely the same way it applies to verbs we will derive (35.d) as a structure intermediate between (35.c) and (35.e):

- (35) (d) The amazement -- the child -- at the performance...  
 (e) The amazement -- DAT[PREP the child] -- INS[PREP  
   the performance]

In (35.d) we have a structure which is clearly ungrammatical, and something must be done to fix it up.

There is, we suggest, a rather general rule of English which inserts of between N and NP anytime other rules happen to generate such a string (provided that they are immediately dominated by a common node). There are examples like (36),





## b. The SINGLE-ACTANT-OF Rule

In addition to the violations of preposition-expectation dealt with by the OF-INSERT rule above, there is a class of violations that appear to have an equally general property of a rather different sort from the preceding. Consider these examples:

- (39) (a) The shooting of the hunters... [AGT]  
           (i.e. the shooting which the hunters  
               did to something or someone)  
       (b) The knowledge of the student... [DAT]  
       (c) The intelligence of the rats... [DAT]  
       (d) The leg of the table... [LOC]  
       (e) The aiming of the gun... [INS]

In (39.a), where we would expect \*The shooting by the hunters, by is replaced with of -- even though by would be retained if an object were present (cf. The shooting of the lions by the hunters). In (39.b) and (39.c), where it is clear that we are dealing with underlying DAT and not derived possessives (i.e. not like that hat of John's), if for no other reason than the fact that they are grammatical with a definite determiner and no relative clause (\*the hat of John's, the hat of John's that I admire; but The knowledge of the student was insufficient), and where ...of the student clearly is not the result of objectivalization (i.e. the intended sense is "knowledge that is inside the head of the student" -- the only kind of interpretation of (39.c) that is possible), we must explain why \*The knowledge to the student is ungrammatical.

Our principle will be this: Where there is only a single actant at the time of application of this rule (which is necessarily early -- it must precede at least the rules of OBJ-DEL and AGT-DEL which delete the objects and agents, respectively, of He sells for a living and The book reads easily), that actant's natural preposition is replaced by of.

To defend this principle we must consider the numerous examples where the "natural" preposition is retained, to see whether they are real or only apparent violations of the SINGLE ACTANT principle. Consider (40) and (41):

- (40) (a) The book by Chomsky/Chomsky's book.  
       (b) The book  $\begin{Bmatrix} \text{on} \\ \text{about} \end{Bmatrix}$  syntax by Chomsky.  
       (c) Chomsky's book  $\begin{Bmatrix} \text{on} \\ \text{about} \end{Bmatrix}$  syntax.



- (d)
- |        |   |          |   |     |                 |     |         |
|--------|---|----------|---|-----|-----------------|-----|---------|
| {The}  | { | poem     | { | {on | NP) by someone. |     |         |
| {A(n)} |   | article  |   |     |                 | {of |         |
|        |   | story    |   |     |                 |     | {about} |
|        |   | photo    |   |     |                 |     |         |
|        |   | portrait |   |     |                 |     |         |
|        |   | statue   |   |     |                 |     |         |
|        |   | song     |   |     |                 |     |         |
|        |   | opera    |   |     |                 |     |         |
- (41) (a)
- |       |   |        |   |                |     |           |       |
|-------|---|--------|---|----------------|-----|-----------|-------|
| {The} | { | insult | { | to someone (by | NP) |           |       |
|       |   | {A(n)} |   |                |     | injury    | {from |
|       |   |        |   |                |     | promise   |       |
|       |   |        |   |                |     | rebuke    |       |
|       |   |        |   |                |     | gift      |       |
|       |   |        |   |                |     | affront   |       |
|       |   |        |   |                |     | stimulant |       |

In (40.d), where the head nouns in some sense contain or imply relatively specific objects (e.g. a statue of someone), it is not unreasonable to maintain that their case frame in the lexicon is of the form (42):

- (42) [+ \_\_\_\_ NEUT AGT] e.g. story
- or
- [+ \_\_\_\_ DAT AGT] e.g. statue

and further to maintain that whenever only the AGT appears on the surface it is the result of OBJ-DEL, a governed rule which deletes the objectivalized NEUT or DAT of these case frames provided that the object is indefinite (or perhaps specified as some particular object: He drinks too much may be argued to derive not from He drinks some beverage too much but rather from something like He drinks intoxicating beverages too much). The parallel argument for (40.a-c) is weaker, but at least books are obligatorily about something in the same way that statues are of someone and stories are of or about something or someone.

Similarly, in (41) there is a strong sense that an agent has been deleted in the derivation -- that it is present in the deep structure and is very much a part of the semantic interpretation. To clarify this claim, consider the two logically possible case frames for a noun like insult:

- (43) (a) [+ \_\_\_\_ DAT (AGT)]
- (b) [+ \_\_\_\_ DAT AGT]

The only difference is the optionality of AGT. If AGT is marked as optional, there should be two possible readings of the sort we get with open:

- (44) (a) The door opened.  
 [+ \_\_\_\_\_ NEUT (AGT)] with AGT not selected.
- (b) The door was opened.  
 [+ \_\_\_\_\_ NEUT (AGT)] with AGT selected, then PASSIVE,  
 then AGT-DEL.

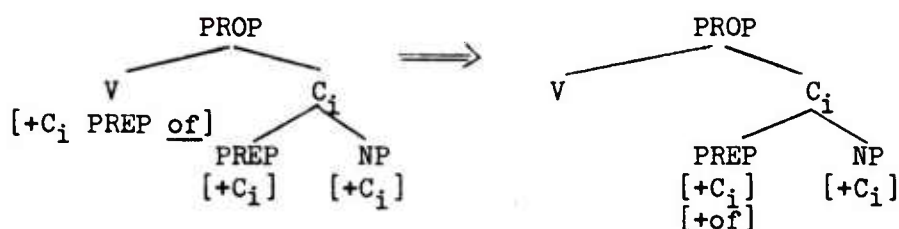
Since there is only one possible reading with the items of (41), we conclude that the correct case-frame for them is (43.b), and that the rule of INDEF-AGT-DEL operates to delete the by-phrase at some time after the SINGLE ACTANT-OF rule has operated, thus leaving -- on the surface -- a single actant that is marked still by its "natural" preposition rather than being replaced by of.

#### IV. THE RULES OF CASE PLACEMENT

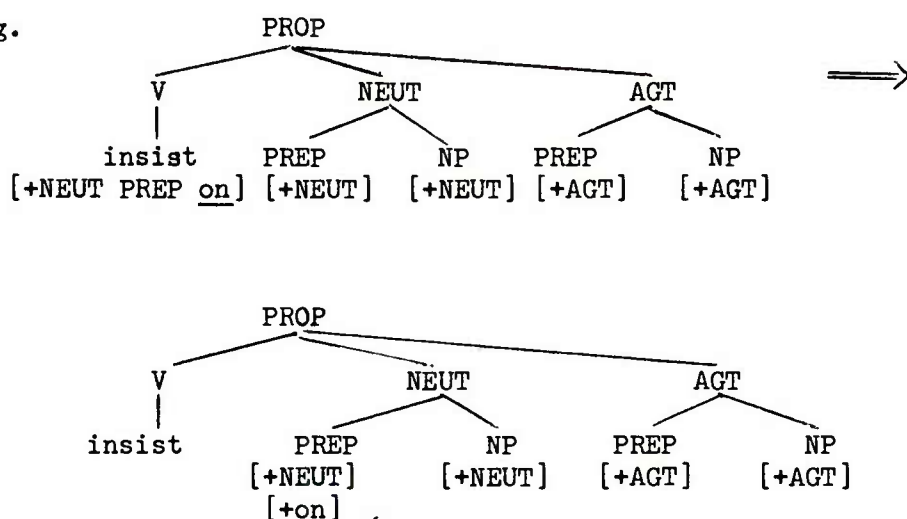
##### A. PREP SPREAD

This rule applies within the case frame only. It provides for the selection of aberrant case-marking prepositions on the basis of features on the head. The only major rule of the grammar that must precede it is GER (non-factive). The insertion of of on the actants of adjectives that are not otherwise marked for PREP SPREAD is accomplished by a redundancy rule which in effect requires that unless they are otherwise marked for this rule they enter into it as if they were marked for of. That is, the redundancy rule examines the adjective, determines whether it has a feature of the form [ $C_i$  PREP prep]; and if it does not, it redundantly attaches the feature [+NEUT PREP of]. Thus sick of, fond of, afraid of, tired of, sure of, certain of, guilty of, envious of, cognizant of, ... acquire this redundant feature; but preferable to, keen on, doubtful about, generous with, ... are marked in the lexicon for the appropriate preposition to be spread by this rule. There are other devices which might be used to guarantee of with adjectives of this type, -- e.g. the of-INSERT rule might be extended to them, arbitrarily, but to do so would require ad hoc deletion of the PREP node which is non-ad-hoc-ly deleted with V and N by the objectivalization rule, since that in turn is motivated by passivization (clearly irrelevant to adjectival predicates). Or, e.g., the PREP SPREAD rule itself could be modified to spread either marked prepositions, or if none were marked then to spread of with adjectival predicates. But the present device is notationally simpler, and exactly equivalent in content: it claims that of is the unmarked preposition with adjectival predicates, which is the only substantive fact that any of these alternatives would capture.

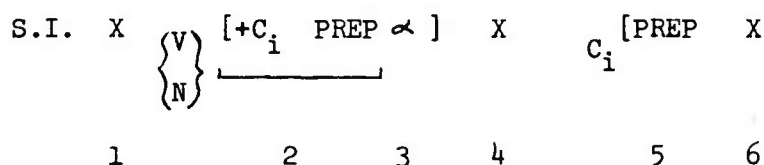
# 1. Schematic of PREP SPREAD



e.g.



# 2. The Rule of PREP SPREAD



S.C. Attach 3 to 5, Erase 2-3

# 3. Notes on the Rule

The preposition of the feature "2" above is extracted and attached (rather than the entire feature) to the appropriate prepositional node, as illustrated in the schematic given above under section 1. The convention of the second lexicon, then, is to specify the

phonological form of such prepositions given only that the single feature [+on], [+of], [+with], etc., is within the feature matrix of the node in question. The second part of the structure change which erases the exception feature that governs the rule in the first place has no purpose except to unclutter the tree somewhat. It can probably be stated in some much more general way: e.g. a convention imposed on all rules that an exception feature is erased after doing its work -- i.e. after governing some rule. The difficulty with such a convention is that one would have to take care to provide that the feature was relevant in only one rule; in the face of that hazard, we have erased features within each rule when we were sure they were no longer needed -- and we have not been consistent in erasing them even under those circumstances.

#### 4. Examples

See in particular III.C, examples and arguments that the prepositions from this rule and other case-marking prepositions and transformationally-inserted ones are intrinsically distinct from prepositions that are lexically inserted. Further examples of spread prepositions:

- (46) (a) He asked Mary for money. [for = marked NEUT]  
 (b) He laughed at her discomfort. [at = marked NEUT]  
 (c) He is familiar with the problem. [with = marked NEUT]  
 (d) His fondness for wine shows in his weight.  
       [for = marked NEUT]  
 (e) He asked a question of her. [of = marked DAT]  
 (f) He agreed with her to leave early. [with = marked DAT]  
 (g) He was amazed at her doing it. [at = marked INS]

B. OBJECTIVALIZATION: MARKED (abbreviated M-OBJ)

The "marked object" features are of the following sorts:

- (a) [C<sub>i</sub> → OBJ]  
e.g. [INS → OBJ] "He aimed the gun at her"  
                    INS  
c.f. "He aimed at her with the gun"  
[DAT → OBJ] "He gave her the money"  
                    DAT  
c.f. "He gave the money to her"
- (b) [<sup>LOC</sup><sub>[prep]</sub> → OBJ]  
e.g. [<sup>LOC</sup><sub>[up]</sub> → OBJ] "He climbed the mountain"  
                                LOC  
cf. "He climbed up the mountain"  
≠ "He climbed down the mountain"

(c) [LOC  
[prep] → OBJ, NEUT  
[prep]

e.g. [LOC  
[on] → OBJ, NEUT ] "He smeared the wall  
[with] LOC  
with paint  
NEUT

cf. "He smeared paint on the wall"

[ LOC  
[of] → OBJ, NEUT ] "He drained the bucket of water"  
[from] LOC NEUT

cf. "He drained water from the bucket"

The general rule of objectivalization [Section C below] is that the first actant to the right of the head is objectivalized, provided there are at least two actants. The three classes of exception features above are optional (i.e. either plus or minus may be chosen in the lexicon) for most items on which they appear; the rule itself is governed by one of these features, and like all governed rules is obligatory. The features which govern the rule appear mostly on verbs. Since adjectives do not permit passivization, and since they always retain the preposition inherent to them, there is no reason to expect them to permit objectivalization at all, and the rules here are so structured as to exclude adjectival predicates. But with nouns, which do permit passivization (cf. The city was destroyed by the enemy, The city's destruction by the enemy), and which do not always retain the preposition inherent to them (It is amazing to the man, but The amazement of the man, ...), we are surprised, a priori, to find few instances of nouns marked by these exception features (even though the general rule of objectivalization, U-OBJ below, includes verbs and nouns equally). It appears to be correct, however, that verbs and nouns are distinct with respect to these exception features. Consider:

- (47) (a) He gave the money to John.  
(a') His giving of the money to John...
- (b) He gave John the money. John was given the money.  
(b') \*His giving of John the money... \*John's giving of the money.

From examples like (47) we conclude that the feature [+DAT → OBJ] is characteristic only of verbs. Note that this feature is excluded only as an exception feature on nouns: it is perfectly normal to have DAT objectivalized under the U-OBJ rule that objectivalizes the first actant:

- (48) (a) The church canonized the saint.  
                DAT  
       (b) The church's canonization of the saint...  
       (c) The saint's canonization by the church...

Features which govern this rule with actants other than dative do, however, appear on nouns, so that M-OBJ does apply:

- (49) (a) He aimed the gun at her.  
INS  
(a') His aiming of the gun at her...  
(b) The gun was aimed at her.  
(b')\*The gun's aiming (of) at her...

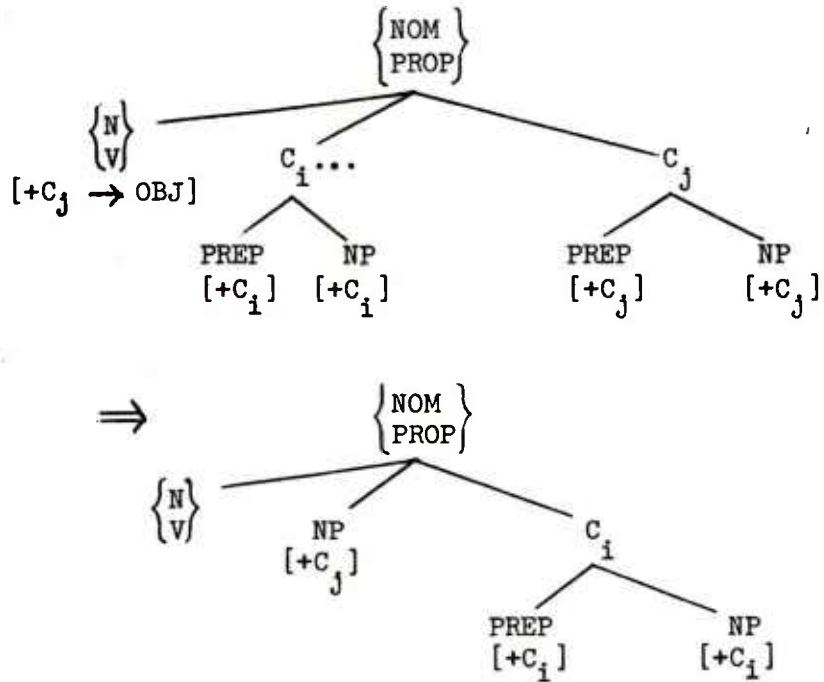
It is clear from (49.b') that such examples do not passivize, which removes one of the motivations for the objectivalization rule; but it is equally clear from (49.a') that they do not retain the inherent preposition but instead pick up the generalized of that typically shows up after objectivalization, via the N-NP of-INSERT rule. The question is, what blocks passivization? If it is only the general fact that non-animate nouns do not prepose comfortably (see GEN), then there is no more problem in blocking passivization of these than of blocking non-animate pre-posing in general. It is difficult to test, since none of the exceptional items--those marked for M-OBJ--are to be construed comfortably with animate nouns, which are the only ones that comfortably prepose as genitives. The question remains unanswered in this grammar: but to avoid generating unwanted passives like (49.b') the PASS SUBJ rule is blocked for nouns in the presence of marked prepositions: this immediately excludes all the possible examples (aim at, fill with, empty of, swarm with, ...) of M-OBJ by the same device that excludes passivization on nouns where the preposition is aberrant: insistence on, compliance with, puzzlement over, as in \*The rules' compliance with by the students: while allowing The city's destruction by the enemy, where there is no marked preposition.

Since the first actant, when there are two, is either NEUT or DAT, exception features like those illustrated above must be provided for all instances where any other actant is objectivalizable, or where DAT is objectivalized even though it is not first actant.

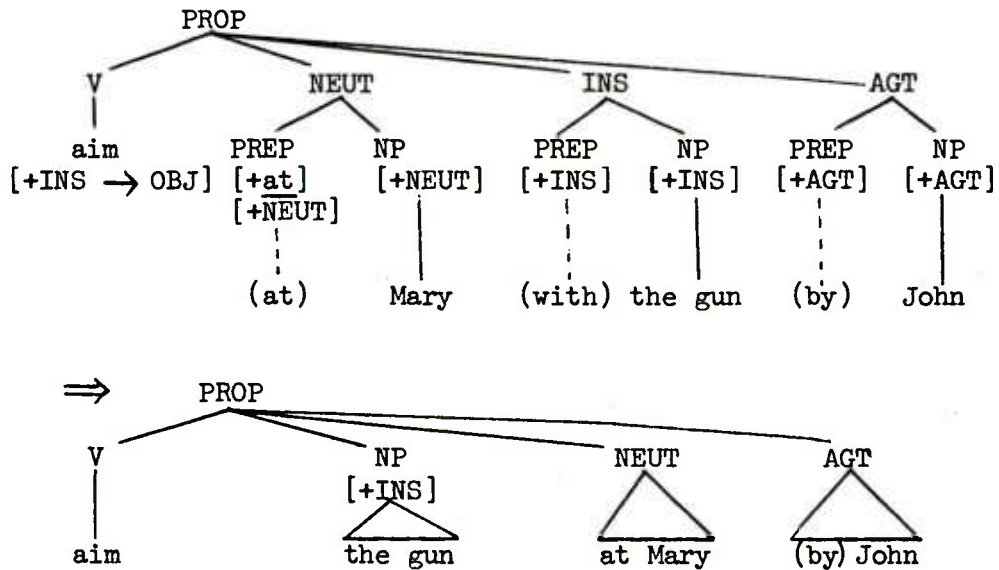


The rule M-OBJ is disjunctively ordered with U-OBJ, since if M-OBJ applies then U-OBJ must not apply to the output.

1. Schematic of M-OBJ.



e.g.



"John aimed the gun at Mary" ACT SUBJ

"The gun was aimed at Mary by John" PASS SUBJ

2. The Rules of M-OBJ

- (a) S.I. X  $\begin{Bmatrix} V \\ N \end{Bmatrix}$   $\xrightarrow{[+C_j]} \text{OBJ}$   $C_i$  [PREP NP] X  $C_j$  [PREP NP] X  $\begin{Bmatrix} \text{PROP} \\ \text{NOM} \end{Bmatrix}$  X
- 1    2                                  3    4    5                  6    7    8                  9

Condition: 2 through 8 are a constituent.

S.C. Attach 7 as right sister of 2; delete 6-7.

- (b) S.I. X  $\begin{Bmatrix} V \\ N \end{Bmatrix}$   $\xrightarrow{[+C_j]} \text{OBJ, NEUT}$   $\begin{Bmatrix} \text{NEUT} \\ [+Prep] \end{Bmatrix}$  [PREP NP] X  $C_j$  [PREP NP] X  $\begin{Bmatrix} \text{PROP} \\ \text{NOM} \end{Bmatrix}$  X
- 1    2                                  3    4    5                  6    7    8                  9

Condition: 2 through 8 are a constituent.

S.C. Attach 7 as right sister of 2;  
Attach [+PREP] (from 2) to 3;  
Delete 6-7.

3. Notes on the Rule

The two forms of the rule differ only in that (b) has built into it essentially a delayed PRED-SPREAD--it requires a marked preposition for the NEUT just in case the indicated actant has been objectivalized. This provides for two polar classes that are semantically related in such a way as to suggest that this syntactic peculiarity of theirs ought to be a general property derivable somehow from their semantic similarity: namely the "privative" and "additive" verbs:

- (50) (a) He emptied water from the bucket.  
      (a') He emptied the bucket of water.
- (b) He loaded hay on the wagon.  
      (b') He loaded the wagon with hay.

The reason these kinds of examples are not ordinary marked neutral prepositions, handled by the PREP SPREAD rule, is that they pick up the aberrant preposition only if the LOC is objectivalized; their form is unmarked in (50.a) and (50.b) when the LOC is not objectivalized.

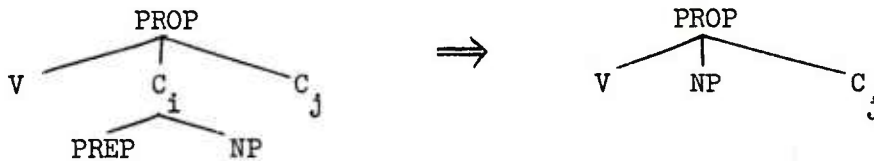
## 4. Examples

See the beginning of this section, IV.B.

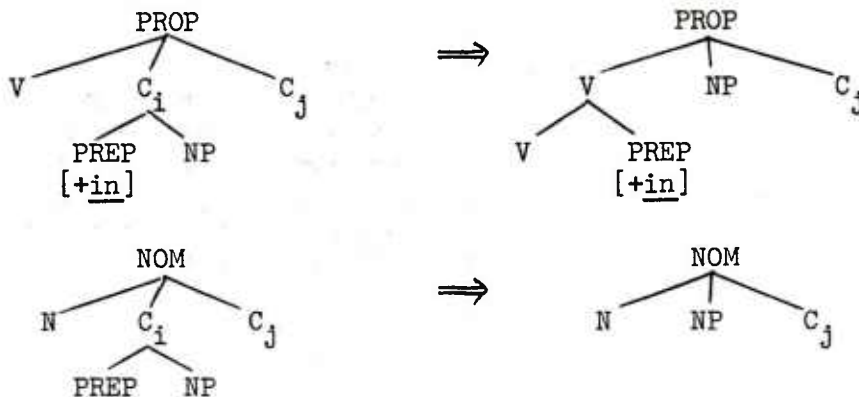
## C. OBJECTIVALIZATION: UNMARKED (U-OBJ)

Since the exceptions in general are handled by M-OBJ, it is to be expected that U-OBJ should be a relatively clean rule. It simply takes the first actant, wipes out its dominating case node, and either erases its PREP node (if it is unmarked--i.e., if no feature [+PREP] has been spread to it by the PREP-SPREAD rule), or attaches its PREP to the head verb by Chomsky-adjunction.

## 1. Schematic of U-OBJ



or:

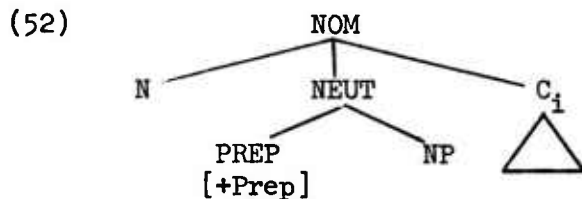


Whether this rule should also provide for Chomsky-adjunction of aberrant prepositions to nouns, making insistence on parallel to insist on, is an open question: it is fairly clear that Chomsky-adjunction with the verb is necessary to provide for the correct passivization (The new program was insisted on throughout the South), and it is certainly clear that passivization must be blocked with the corresponding nouns (\*The new program's insistence on throughout the South). But since passivization has to be blocked anyway for nouns with marked prepositions in the case frame (see discussion under IV.B), it costs nothing more to

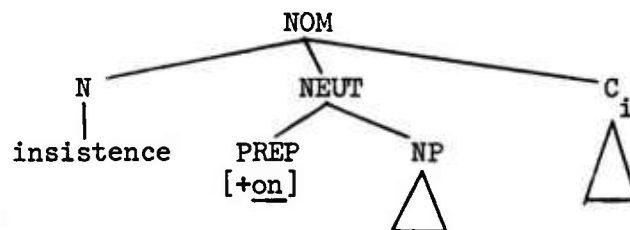
block these by the same device within the PASS SUBJ rule. For some speakers all passivization on heads with marked prepositions, either nominal heads or verbal heads, is at best marginally grammatical--i.e. such speakers reject (51) throughout:

- (51) (a) (?)The proposal was referred to by the chairman.  
 (a') \*The proposal's referral to by the chairman...  
 (b) (?)The privilege was insisted on by the general.  
 (b') \*The privilege's insistence on by the general...  
 (c) (?)The problem was puzzled over by the whole class.  
 (c') \*The problem's puzzlement over by the whole class...

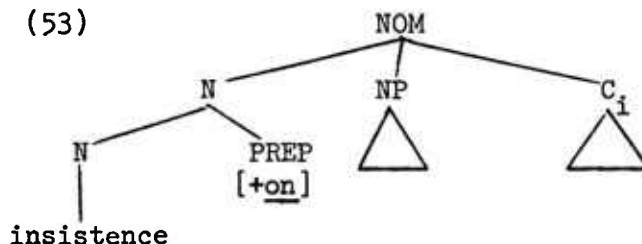
It is not worthwhile to make much over this: either the U-OBJ rule can exclude nouns with marked prepositions from its domain, thereby guaranteeing they will not passivize since they will have the structure (52) at the time of passivization;



e.g.



or the PASS-SUBJ rule can exclude them even though they have the structure (53), because they contain a marked preposition which is the basis for excluding some of the output of M-OBJ anyway:



Since the PASS SUBJ rule has other idiosyncrasies (e.g. some verbs like have, resemble, want... must be excluded by an exception feature), it is on the whole less capricious to assign this one to the passive rule also.

## 2. The Rule of U-OBJ

(a) S.I. X  $\begin{Bmatrix} V \\ N \end{Bmatrix}$   $C_i$  [PREP NP] X  $C_j$  X

1    2            3        4    5   6    7

Conditions: 1) 2 through 6 are a constituent;  
2) if 5 is null and 6 = LOC, the rule does not apply.

S.C. Chomsky-adjoin 3 as right sister of 2;  
Attach 4 as right sister of 2;  
Erase 3-4.

(b) S.I. X  $\begin{Bmatrix} V \\ N \end{Bmatrix}$   $C_i$  [PREP NP] X  $C_j$  X

1    2            3    4    5   6    7

Conditions: 1) 2 through 6 are a constituent;  
2) if 5 is null and 6 = LOC, the rule does not apply.

S.C. Attach 4 as right sister of 2;  
Erase 3-4.

## 3. Notes on the rule

The two forms of the rule (a) and (b) differ only in that the preposition of the first actant is a marked preposition in (a) and therefore Chomsky-adjoined (as in insist on), whereas in (b) the preposition of the first actant is unmarked and therefore deleted under objectivalization. The rule applies equally to true verbs, to adjectives, and to nouns--though only the (a) version of the rule will in fact ever apply to adjectives because they all have (by virtue of a redundancy rule) a prepositional marking of their object. As noted in the discussion of M-OBJ above this is not a substantive claim about adjectives: it would be equally possible to except adjectives from this rule and allow the of to be inserted by the N-NP of-INSERT rule. The only substantive claim in either mechanism is that of is the unmarked preposition with adjectives.

It is worth pointing out that X-6 guarantees the rule will apply only if there are at least two actants in the PROP or NOM. Otherwise all intransitive verbs would have their subjects pass through this rule and indeed would be able to get surface subjects only via the passive subject rule. Also NP's like the intelligence of the rats would have the single actant objectivalized and undergo of-INSERT in a way that is counter-intuitive: see III.C.2.b above.

#### 4. Examples

Objectivalized examples have been scattered throughout the discussion up to this point. Some typical instances of the (a) version of the rule are seen in (54):

- (54) (a) He insisted<sup>^</sup> on an answer right away.  
NEUT
- (b) His insistence<sup>^</sup> on the correct answer was a pain  
NEUT  
in the neck.
- (c) He is pretty keen<sup>^</sup> on golf.  
NEUT
- (d) I'm very fond of golf. [Unmarked ADJ Prep = of]  
NEUT
- (e) My fondness for golf gets me into trouble.  
[Marked N Prep = for]

Typical instances of the (b) version of the rule are seen in (55):

- (55) (a) The church finally canonized the saint.  
DAT  
(b) I never did hit the ball.  
NEUT  
(c) The church's canonization of the saint...  
DAT  
[of by subsequent rule of of-INSERT]  
(d) I like golf.  
NEUT  
(e) I like Mary. [Note that the object of like is not  
NEUT dative, though animate in this example,  
because it is not obligatorily  
animate. Objects which are neces-  
sarily animate are dative.]

#### D. PASSIVE SUBJECT PLACEMENT (PASS-SUBJ)

Most verbs and nouns in the lexicon are marked +/- for the feature PASS--that is, the passive rule is optional for most head



items. But it is marked minus for verbs like have, marry, resemble, and also for some nouns like marriage, resemblance. Consider:

- (56) (a) John married someone.
- (b) John's marriage to someone...
- (c) Someone married Jane.
- (d) Jane's marriage...

Clearly (56.a) and (56.b) are proper paraphrases; but (56.d) is not a paraphrase of (56.c)--the genitive comes only from the underlying agent, not the underlying dative, with this noun. This is not a general fact about what can genitivize, but rather a particular constraint on the noun marriage, since other nouns allow genitivization of the object (i.e. passive) or of the agent, equally:

- (57) (a) The city was destroyed by someone.
- (b) The city's destruction...
- (c) A portrait of Smith by Jones...
- (d) Smith's portrait by Jones...
- (e) Jone's portrait of Smith...

Of course many nouns--probably most concrete nouns and the majority of abstract nouns that are not verb-related--do not have lexically-defined case frames, and the questions raised by nouns like destruction or portrait do not arise with them. That is, nouns like tree, street, linguistics, ivy, microphone, glass, ... [a random list of nouns, intended to represent the great majority of all the nouns in the language] do not imply any particular actant, whereas portrait implies object and agent, and verb-related nouns like destruction imply (usually) the case-frame of the corresponding verb.

As developed in GEN, there are conditions which appear to constrain the genitivization of actants in nominal constructions, but these appear to be functions not of constraints on the subject placement rules but rather of general output conditions on length and animateness of preposable genitives. The conditions are extremely complex, involving such questions as whether the NP to be genitivized is [+DEF] or [-DEF], as in (58):

- (58) (a) \*The girls were disturbed by a man's sudden appearance on the balcony. [GEN 207.a]
- (b) The girls were disturbed by the sudden appearance of a man on the balcony. [GEN 107.b]

and the conditions are complicated further by considerations of pronominal form (see especially the discussion of this point in GEN, centering around the examples 211-216). The most crucial condition--and even it cannot in fact be more than partially formulated here--

has to do with the animateness feature of the genitivized noun. While it is true that such strings as (59) are well-formed, those of (60) suggest that inanimates ought to be blocked in genitivization, especially where it results from the passive rule:

- (59) (a) The city's destruction...  
 (b) The city's destruction by the enemy...  
 (c) The building's demolition...  
 (d) The building's recent demolition by the wrecking crew...  
 (e) The sentence's construction left little to be desired.
- (60) (a) \*Our house's picture... Picture of our house...  
 [NEUT -- Passive]  
 (b) \*The table's leg... The leg of the table...  
 [LOC]  
 (c) \*Linguistics' aim... The aim of linguistics...  
 [Possessive? Dative?]  
 (d) ?The book's author... The author of the book...  
 [NEUT -- but no AGT]

The examples of (59) have in common the fact that the head nouns are obviously verb-related--i.e. they are classic instances of the type of noun which would be transformationally, not lexically, derived by e.g. Lakoff (1965) and Lees (1960). The examples of (60) have in common the fact they are at least not obviously to be derived transformationally under any theory (i.e. picture, leg, aim, and author, though all of these except leg could be derived from verbs with a little pushing). Quite possibly, the difference is a relatively surface matter of the following sort: the nouns of (59) all contain an obligatory actant NEUT in their case frames (i.e., they all have to have objects). No similar fact obtains for the examples of (60). Another set of verb-related nouns which require DAT objects (e.g. canonization, assassination, murder, rejuvenation, promotion, execution, ...) clearly are well-formed with preposed genitives (i.e. preposed by virtue of the passive rule):

- (61) (a) the saint's canonization... the canonization of  
the saint...  
(b) Kennedy's assassination... the assassination of  
Kennedy...  
(c) the prisoner's execution... the execution of the  
prisoner...

From (59) and (61) one might well conclude that the constraint, at least for passive subject placement, could be stated on the basis of presence or absence of obligatory object in the case frame (whether NEUT or DAT then being irrelevant for this purpose). But further examples render this suggestion unpromising:

- (62) (a) \*the settlement's negotiation by Harriman...  
the negotiation of the settlement by Harriman...
- (b) \*her resignation's acceptance by the dean...  
the acceptance of her resignation by the dean...
- (c) \*the sound's pronunciation by a foreigner...  
the pronunciation of the sound by a foreigner...
- (d) \*the offer's refusal by the professor...  
the refusal of the offer by the professor...
- (e) \*the food's distribution by America...  
the distribution of the food by America...

Certainly the nouns negotiation, acceptance, pronunciation, refusal, and distribution are as closely verb-related, and imply objects as strongly, as the nouns of (59) destruction, demolition, construction.

By and large, however, it is difficult to get agreement among informants on the question of the viability of (59), (60), (61), and (62). The most discriminating speakers seem to reject all of them except (61) and—against any reasonable rule we can infer—also (59.a,b). Ignoring the city's destruction, a constraint which appears to be close to the truth is one which limits passive subject placement on nouns to objects which are deep structure datives: i.e. (61). One would then like to make the generalization that the well-known though imperfect constraint of preposed genitives to animates is redundant on the constraint of datives and agents to animates. But such a generalization immediately fails in the face of evidence that there can be animate neutrals which prepose under the passive rule as easily as datives. Portrait and statue are restricted to animate objects--i.e. to Datives; whereas photograph and picture take any concrete object. But, as the examples of (63) show, preposing is determined by animateness:

- (63) (a) the portrait of the queen/\*tree (by Titian)...
- (b) Titian's portrait of the queen/\*tree...
- (c) the queen's/\*tree's portrait by Titian...
- (d) the photograph of the queen/tree (by Eichner)...
- (e) Eichner's photograph of the queen/tree...
- (f) the queen's/\*tree's photograph by Eichner...

An additional set of observations about simple intransitives makes it pointless to consider trying to incorporate the animateness condition on genitivization into the general case placement rules: namely the fact that the animateness condition holds even with intransitives, though imperfectly there also:

- |          |                                |                                       |
|----------|--------------------------------|---------------------------------------|
| (64) (a) | John's late arrival...         | ?The late arrival<br>of John...       |
| (b)      | *The package's late arrival... | The late arrival of<br>the package... |
| (c)      | ?The train's late arrival...   | The late arrival of<br>the train...   |

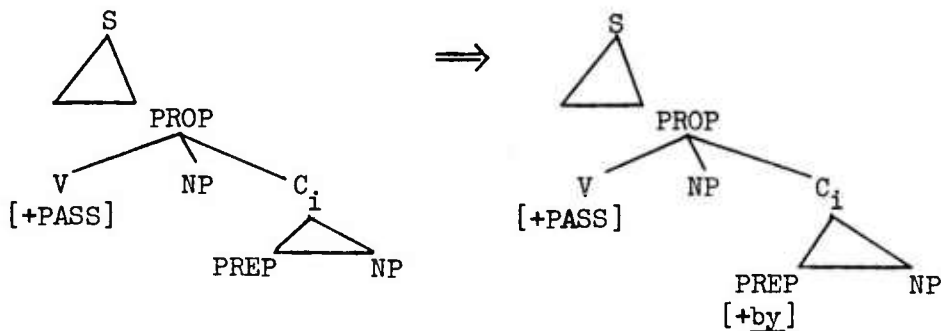
The fact that (64.a.ii) is highly suspect indicates that still other considerations--proper/nonproper, nominal/pronominal, ...--enter into the preposing constraints that set the limits of genitivization. For further discussion see GEN.

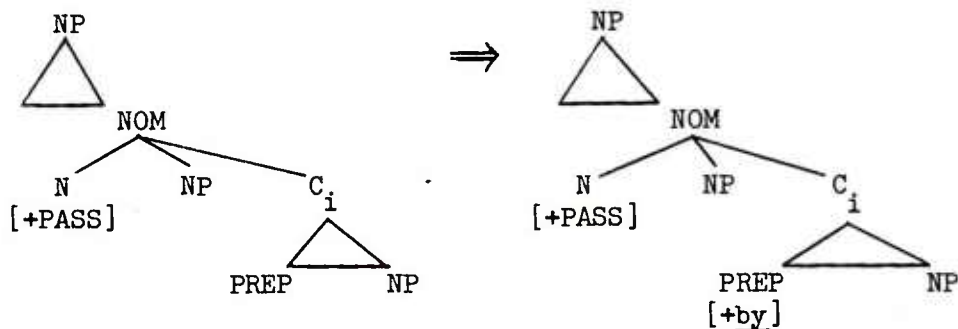
The PASS-SUBJ rule, as formulated below, simply ignores the problems outlined above, thereby generating many genitives that are rejected by most discriminating speakers (though for every type it is possible to find a few examples that are not especially unhappy). The rule is broken into two parts. The first part--which is all that has to take place with noun heads--replaces the inherent preposition of the last actant with the preposition by. This first part of the passive rule is motivated by the fact that by can mark the agent or the instrument with nouns (the destruction of the city by the enemy, the destruction of the city by fire) and with verbs it can mark instruments, datives, or agents as passive agents:

- |          |  |       |
|----------|--|-------|
| (65) (a) | He was surprised <u>by</u> the news.       | [INS] |
| (b)      | The answer was known <u>by</u> the dunce.  | [DAT] |
| (c)      | The house was bought <u>by</u> the broker. | [AGT] |

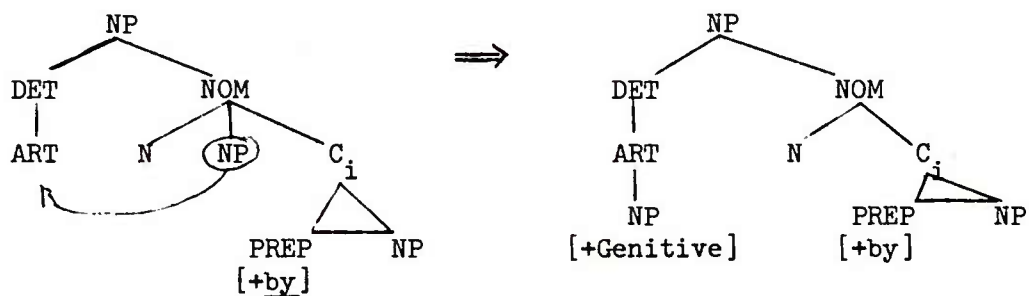
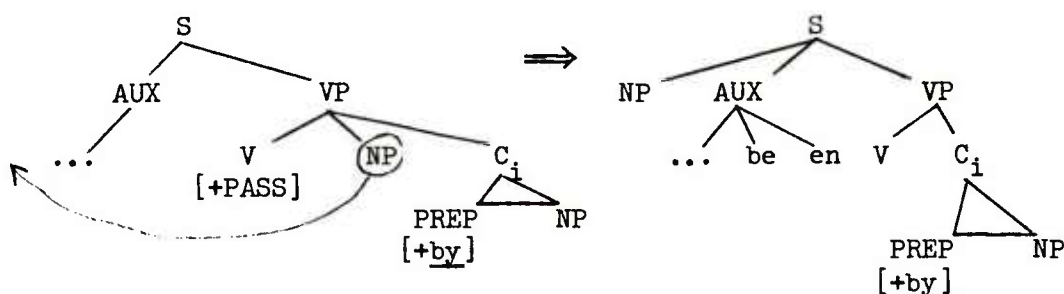
The second part of the passive rule performs the familiar operation of moving the object into subject and inserting the appropriate auxiliaries with the verb.

#### 1. Schematic of PASS-SUBJ-BY-PLACE





Schematic of PASS-SUBJ



## 2. Rule of PASS-SUBJ-BY-PLACE

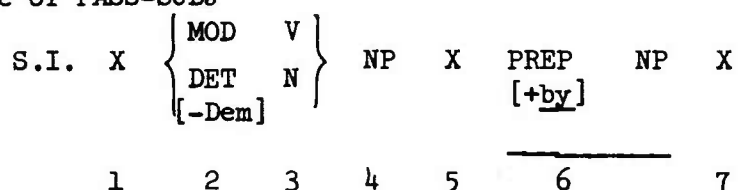
S.I.	X	$\begin{Bmatrix} N \\ V \end{Bmatrix}$	NP	X	PREP	NP	X
	1	2	3	4	5	6	7

Conditions: 2-6 is a constituent;  
 2 has the feature [+Pass];  
 If 2 = N, then 5-6 is immediately dominated by  
 AGT or INS.

S.C. [+Prep, by] replaces features on 5.



## Rule of PASS-SUBJ



Conditions: 3-6 is a constituent;  
 If 3 = N, the rule is optional;  
 If 3 = V, the rule is obligatory.

S.C. Attach 4 as left sister of 2;  
 If 3 = N, attach the feature [+Genitive] to 4;  
 If 3 = V, attach be + en as right daughters of 2;  
 Erase original 4.

## 3. Notes on the Rules

The condition of PASS-SUBJ-BY-PLACE that 2-6 is a constituent guarantees that the rule will apply to a single VP or NOM, and it also guarantees that 5-6 will be the last prep-phrase, the last actant, of the constituent. The corresponding condition performs the same function in PASS-SUBJ. The rule can easily be formulated to accomplish the same ends without this condition, by imposing appropriate brackets on the structure index. The condition that the head has the feature [+Pass] guarantees that the rule will apply only to those verbs and nouns which permit passive, and that it will apply only in those instances where under the convention of obligatory specification in the lexicon the choice of [+Pass] has been made (and, of course, it guarantees passive for those heads that require the passive: see LEX). The feature [+Pass] need not be mentioned in PASS-SUBJ, since the structure index is unique by virtue of the feature [+by] in 6, which can come only from the first half of the passive rule.

It is assumed that strings like the city's destruction (without an expressed agent) are derived from the city's destruction by someone by a rule of Indefinite Agent Deletion. Alternatively, the agentive node could be made optional for nouns in the rule. There are fairly strong motivations for the former alternative, however: in particular, unless this assumption is made, an explanation of the failure of the SINGLE-ACTANT-of rule to operate in examples like (41) above (insult to, injury to, etc.) must be sought, though its failure is a natural consequence of this analysis that derives passives without agents by deletion of indefinite agents. This analysis is semantically correct, also: nouns and verbs with passive subjects do imply the existence of agents.



Since adjectives are always (redundantly) marked [-Pass], they can never fit the structure index of the passive rules even though ADJ is dominated by V and has all the appropriate actants which would otherwise enable it to meet the structure index of the passive rules.


#### 4. Examples.

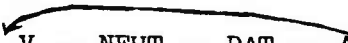
See above, (57) - (65).

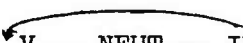
#### E. ACTIVE SUBJECT PLACEMENT (ACT-SUBJ)

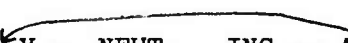
Just as there are irregular objects (see IV.B above for discussion of "marked objects"), there are certain verbs which must be marked as permitting the subjectivalization of actants which are in some respects irregular. The general rule is that the last actant other than a locative becomes surface subject in the active:


(66) (a)  V -- NEUT : The package arrived.  
The book fell.  
The door opened.


(b)  V -- NEUT -- DAT : The boy knows the answer.  
Mary received the package.  
John inferred that he was wrong.


(c)  V -- NEUT -- DAT -- AGT : John threw the ball to Mary.  
John gave the answer to NASA.

(d)  V -- NEUT -- INS : The key opened the door.  
The knife cut the salami.

(e)  V -- NEUT -- INS -- AGT : John opened the door with the key.  
John cut the salami with the knife.

(f)  V -- NEUT -- DAT -- INS -- AGT : John opened the door for Mary with the key.  
John cut the salami for Mary with the knife.

(g)  V -- DAT -- AGT : The church canonized the saint.  
The criminal murdered the girl.

- (h)  V -- DAT : The criminal died.  
John is certain.

A locative actant may optionally be present in any of the examples of (66) (or any of the other possible case frames) without affecting subject placement. But with a few subclasses of verbs, the locative can be subjectivalized:

- (67) (a) The pool filled with water.      Water filled the pool.  
      (b) The garden swarmed with bees. Bees swarmed in the garden.  
      (c) The pool contains water.      \*Water contains in the pool.  
      (d) The floor was slimy from algae.      It was slimy on the floor from algae.  
      (e) The battlefield was gory with blood.      It was gory on the battlefield with blood.

Some verbs, it appears from (67.c), must be marked as having the locative subject obligatorily: i.e., in the format developed earlier for irregular objects, contain is marked [+LOC → SUBJ], and to be sure the semantics is preserved, it should probably be additionally specified that the locative preposition is in. With any other preposition the structure would have to block. The verb fill (67.a) is interesting in that the locative must either objectivize or subjectivize: that is, the locative cannot appear on the surface with a preposition (\*In the pool filled with water, \*Water filled in the pool). The adjectives of (67.d) and (67.e) appear to differ from the verbs only in that subjectivization is optional: if the option is not taken, then the DUMMY-it-INSERT rule must apply--the same rule that applies to examples of extraposition, like It surprised her that he could be right.

Some adjectives appear to require a feature [+NEUT → SUBJ]:

- (68) (a) The music is familiar to him.  
      (b) He is familiar with the music.

But the usual adjective case-frame does not have this exception feature:

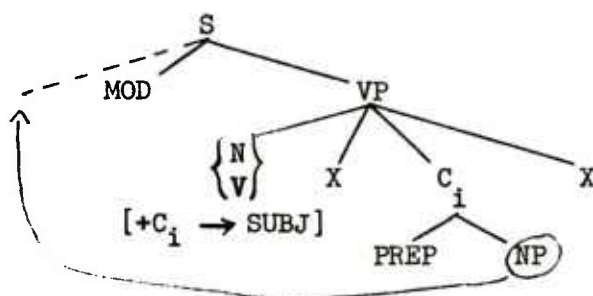
- (69) (a) He is acquainted with the music.  
      (b) \*The music is acquainted to him.  
      (c) He is certain of the answer.  
      (d) \*The answer is certain to him.

Certain classes of nouns--in particular, meteorological nouns, part-whole nouns, and measure nouns--must be marked to permit LOC subject placement (see discussion in GEN), because of examples like:

- (70) (a) The weather in Chicago. - Chicago's weather.  
 (b) The edge of the table. - the table's edge  
 (c) The height of the mountain - the mountain's height

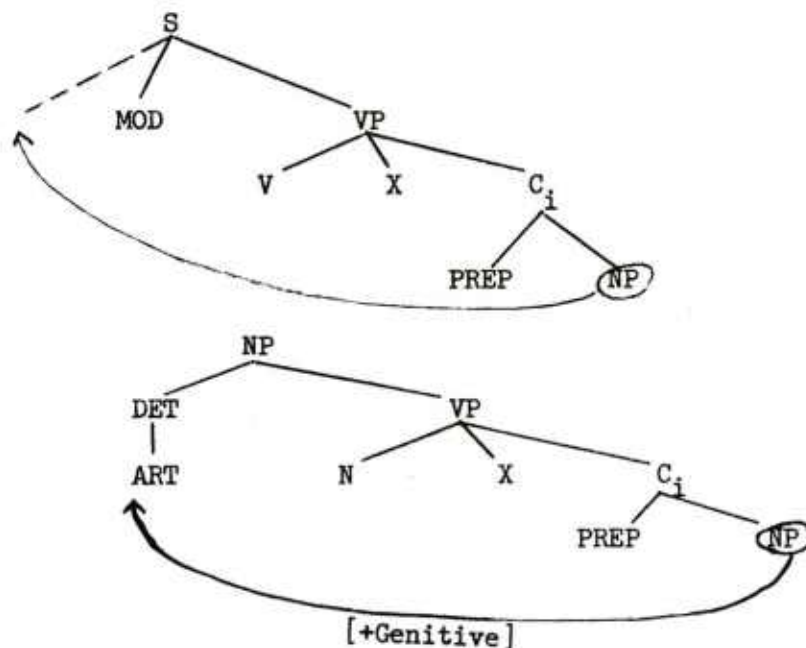
Because of these apparently exceptional items--verbs like fill, adjectives like familiar, and nouns like edge--the ACT-SUBJ rule must be set up, like objectivization, in two forms: marked (governed, exceptional), and unmarked.

1. Schematic of M-ACT-SUBJ



The intention in the diagram above is to represent with the X's the fact that the actant which becomes subject need not be either first or last: that it is plucked out of a string of actants by virtue of the exception feature specified on the head.

Schematic of ACT-SUBJ (unmarked)



2. The Rule of M-ACT-SUBJ

S.I.    X     $\left\{ \begin{array}{cc} \text{DET} & \text{N} \\ \text{MOD} & \text{V} \end{array} \right\}$     X     $C_i$  [PREP NP]    X    X

          1     2     3     4            5    6        7    8

Conditions: 3-7 is a constituent;  
               3 has a feature of the form  $[+C_i \rightarrow \text{SUBJ}]$

- S.C. (a) If 3 is V, attach 6 as left sister of 2;  
               delete 5-6.  
       (b) If 3 is N, attach 6 to 2 with the feature [+Genitive]  
               added to it;  
               delete 5-6.

3. The Rule of ACT-SUBJ

S.I.    X     $\left\{ \begin{array}{cc} \text{MOD} & \text{PROP}^{[V]} \\ \text{DET} & \text{NOM}^{[N]} \end{array} \right\}$     X     $C_i$  [PREP NP] X]  $\left\{ \begin{array}{c} \text{PROP} \\ \text{NOM} \end{array} \right\}$     X

          1     2            3     4     5    6        7    8            9

Conditions: (a) Obligatory if 3 = V, or if 3 = N and 5 = DAT;  
               (b) 8 = LOC, or is null;  
               (c) 5  $\neq$  LOC.

- S.C. (a) If 3 is V, attach 7 as left sister of 2;  
               delete 5-6-7  
       (b) If 3 is N, attach 7 to 2 with the feature [+Genitive]  
               added to it;  
               delete 5-6-7.

4. Notes on the Rule

In the conditions stated for M-ACT-SUBJ, the first condition ("3-7 is a constituent") asserts no more than what the labeled brackets PROP [ ] and NOM [ ] assert. That is, X-7 is the last constituent of PROP or NOM. It is unnecessary to mark the brackets in this rule, since the constituent 5-6 can be any one of several, and is selected by a feature on the head. But in ACT-SUBJ the brackets are needed, in order to specify that the last actant other than a locative in that constituent NOM or PROP is the one which can/must be moved to surface subject. That is, condition (b) that X-8 is LOC or null has the consequence that 6-7 is the last actant, or the last actant but one, and that one is LOC. Thus He resides in Chicago

is generated from resides DAT he LOC in Chicago. The condition (c) that  $5 \neq \text{LOC}$  prevents the rule from applying to the same string if 8 is taken as null--that is, the two conditions (b) and (c) together guarantee that LOC will be subjectivalized only if the head contains a feature which brings the marked version of this rule into operation.

It is probably somehow correct that condition (a) is needed for nouns in the rule ACT-SUBJ, that the rule is obligatory if  $3 = N$  and  $5 = \text{DAT}$ , though it creates some problems. It is motivated by these kinds of examples, discussed further in GEN:

- (71) (a) his cleverness with his hands...
- (b) \*the cleverness of him with his hands...
- (c) John's interest in music...
- (d) \*the interest of John in music...
- (e) John's arm...
- (f) \*the arm of John...

It is not hard, however, to find counterexamples to the claim that subjectivalization is obligatory:

- (72) (a) the monstrous nose of Cyrano de Bergerac...
- (b) she fell into the arms of her lover...
- (c) the main interest of the Chancellor in the  
          space problem is...

Such examples stand, for the moment, unaccounted for by the present rules.

It is clear that if passive and active are to be derived directly, as in this grammar, from a common underlying deep structure, they must be ordered as in these rules. Passive can follow active only if it is stated as switching both agent and object, whereas in this grammar "agent" can be either a deep structure actant which remains untouched by the passive rule, or a surface structure phrase assigned to some other actant by the passive rule. The motivation is partly semantic, namely that the interpretation of (73.a) is quite distinct from that of (73.b):

- (73) (a) The packages were received DAT by Mary.
- (b) The guests were received AGT by Mary.

The traditional passive rule would, however, capture this distinction with verbs, since verbs have obligatory subject placement. In the corresponding nominal construction, such is not the case:

- (73) (c) \*the package's reception by Mary...  
 (d) the reception of the package by Mary...  
 (e) the guests' reception by Mary...  
 (f) \*the reception of the package's by Mary...

(73.c) is ungrammatical; to account for this fact, subject placement must be disallowed with inanimate objects (the problems thus entailed are discussed above under IV.C and in GEN). But (73.d) is viable, with passive agent but without subject placement (i.e. genitivization). To derive (73.d) from an underlying active would require that (73.c) be taken as an intermediate stage and thereby enormously complicate the description of the genitive, which under the present analysis, while it has problems, at least has no problem in stating the conditions of post-positioning of genitives. If (73.c) were taken as intermediate to (73.d), then special conditions would have to block (73.f). In short, given the initial framework of case grammar of genitivization from deep structure cases, it seems unavoidable that passives not be treated as formed from actives, but rather that both be formed by quite similar rules from a common deep structure.

#### F. MINOR RULES

There are several minor rules, and minor conditions on major rules, that have been deliberately omitted (quite apart from many such that have been inadvertently omitted) because they are not clear enough to formulate with precision. Some of these are outlined below.

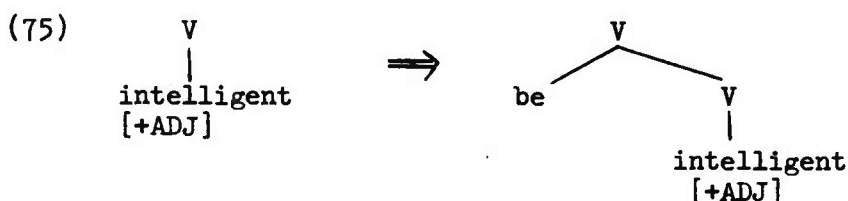
1. On the PASS-SUBJ rule, there needs to be some condition which will block its operation just in case the object NP is a subjectless infinitive (see discussion in NOM II.B.3.a).

2. There needs to be some rule to insert be just in case the main predicate is an adjective. Such a rule would be of approximately the form below:

#### (74) BE-insertion

S.I.	X	V	X
		[+ADJ]	
	1	2	3

S.C. Chomsky-adjoin be as left sister of 2.





3. The SINGLE-ACTANT-of rule (III.C.2.b above) must precede SUBJ-PLACE and INDEF-AGT-DEL in order not to generate injury of someone from injury to someone (by someone). The rule is approximately of the form:

(76) SINGLE-ACTANT-of

S.I.	S	$\left\{ \begin{matrix} V \\ N \end{matrix} \right\}$	PREP	NP	X
	1	2	3	4	5

Condition: 2-4 is a constituent.

S.C. Attach [+of] to 3 and delete features other than [+PREP] on 3.

The condition guarantees that the prepositional phrase will be the only actant on the head, which is apparently the only condition needed if the rule is ordered correctly.

4. The of-INSERT rule is quite possibly of much broader utility than that to which it is being put here. It is used here (see III.C.2.a above) only to insert the preposition of after any preposition whatever has been deleted under the conditions of objectivalization with noun heads. It may well need to be invoked to account for of in strings like (77):

- (77) (a) the vice of intemperance  
 (b) the age of senility  
 (c) the city of Paris

The formulation of the rule below, which includes (77), is almost certainly too loose, too broad, for serious use:

(78) of-INSERT

S.I.	X	N	NP	X
	1	2	3	4

Condition: 2 and 3 are immediately dominated by NOM.

S.C. Attach <sub>PREP</sub>[of] as left sister of 3.

August 1969

## DETERMINERS

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## DETERMINERS

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## II. ANNOTATION AND DISCUSSION OF ISSUES

### A. ART

#### 1. Sources of Articles

##### (a) Outline of Positions

There have been a number of sources suggested for the items which we call Articles.

##### (i) A Category Plus a First Lexical Lookup

In Chomsky (1957) and Lees (1960) articles were the final re-write of a terminal category. They were thus handled exactly like other lexical items.

Again in (1965) Chomsky treated articles much the same as other lexical items. They both were inserted into appropriate base P-markers from the lexicon. There was now the added refinement of matching features of the terminal node with those of the lexical items, however.

The deficiencies of this position will be taken up momentarily.

## (ii) Segmentalization from Features on the Noun

Postal (1966) has suggested that articles (and pronouns as a subset) be represented in the deep structure as syntactic features on the head noun. There is no such category as ART in the phrase structure. The features relevant to articles are in part inherent to the noun (e.g., [ANIMATE], [MASC], etc.) and in part determined by T rules such as pronominalization, reflexivization, and definitization. Relatively late in the derivation "segmentalization" rules apply to each NP copying out the features needed for articles. The phonological shape of the items matching these sets of features is then attached in a late lexical lookup.

Rosenbaum (1968) adopts Postal's position in toto. Bach (1967) adopts such a position also but does not elaborate on it. Perlmutter (1968) also holds that the node ART has no motivation but he obtains only the definite article from features on the noun, the indefinite article coming from the numeral one.

## (iii) A Category Plus a Second Lexical Lookup

The UESP has adopted a position midway between the first two proposals. In this view the PS contains a terminal category ART into which only syntactic features are inserted on the first lexical lookup. Following various T's which change the feature composition of the ART's (cf. REL, PRO, and NEG), a second lexical lookup provides the phonological shape of the reconstituted ART.

Fillmore (1966d) postulated such a view stating that features such as [DEF] and [DEMONS] are inherent while [PLURAL], [COUNT], [MASC], [HUMAN], and [ACCUS] are added by feature-modifying T's.

## (iv) Subsources

The sources which are considered in the above three sections have not been accepted universally for all types of articles. Some particular articles have been assumed to come from sources not yet mentioned.

Perlmutter (1968) has suggested the category numeral as source for the indefinite articles. Baker (1966) contends that indefinite articles derive from existential sentences. Annear (1967) and Robbins (1962-3) have proposed that the definite article be transformationally derived. We will consider each of these views under the sections relating to them specifically.



## (b) Justification of the UESP Position

We argue first for the validity of a feature source for articles (common to positions b and c above). Then we will give motivations for having a node ART.

From the metatheoretical viewpoint, a feature analysis simplifies greatly the description of syntactic phenomena which are indicated by articles in English. The fact that some languages express definiteness by suffixes, others by proclitics, others by both, and still others by choice of sentence types or ordering, can be captured in one metatheory if features are employed.

Analyzing the articles into component features allows this and that to be treated as articles sharing with the the feature [+DEF] but differing with the with respect to the feature [ $\pm$ DEM(onstrative)] and differing from each other only by a single feature (which we have arbitrarily called [ $\pm$ FAR]). It also allows which and what to be regarded as deep structure articles differing from other articles by the feature [+WH] and from each other by the feature [ $\pm$ DEF]. Without such an analysis, a much larger number of otherwise unmotivated nodes would be needed in the deep structure. Other features utilized in the article system are discussed below in III.B.1.-2.

The decision as to whether a node ART is desirable is not so clear-cut. In favor of segmentalization, Bach (1967b, p. 464) has argued that (1) many of the T rules involving nouns are simpler if the DET is omitted until late in the T's and (2) the absence of an article with some proper names and generics argues against an obligatory node ART. Bach's point re: the non-universality of the modes of manifestation of concepts expressed in English by articles is a third argument against a node ART for English (if one assumes the quest for a universal base valid).

The counter-argument to Bach's first point is that there are other T's which refer to ART and these are simplified by the presence of a constituent or node ART. All such T's under Postal's segmentalist position would require reference to a set of features which characterize articles. Under Rosenbaum's approach (1968) a feature [+ART] identifies the segmentalized item so that later T's could refer simply to that feature. In answer to Bach's second contention, it is quite simple to have certain sets of features be realized phonetically as zero.

It should be noted that one important consequence of the segmentalization of ART's would almost certainly be the abolition of the D(eterminer) node. This follows from the fact that all of the determiner constituents other than the article are optional: hence if the article itself originates as a bundle of features on the noun, the whole D constituent would be optional. But then in order that all segmentalized ART's end up with the same constituent structure, if ART is added under D when D is present, the segmentalization rule would have to add a D node in just those cases where D was not chosen in the base.

It may be possible to find strong support for the claim that D is not a deep structure category, but just a notational abbreviation for a sequence of separate categories all dominated directly by NP. However, since we have not found any independent motivation for giving up the D node and are not aware of any alternative proposals which include other parts of the determiner besides the article without using a D node, we prefer to keep the D node and therefore have additional reason not to introduce articles by segmentalization.

## 2. Indefinite

We have noted above the various proposed sources of articles. Practically all analyses, regardless of the source posited, have treated the definite and indefinite ART's in the same way.

Perlmutter (1968) has proposed a fundamental dichotomy between definite and indefinites which is based on their having different origins. The is introduced as a feature on the NP (reminiscent of Postal). A(n) is a surface form derived from the deep structure numeral one. Thus, in contrast to some other views which oppose the and a in the deep structure, the and a are entirely independent of each other in the deep structure under Perlmutter's approach.

Perlmutter has given an impressive list of eleven contexts which a and one have in common. One of these suggests they are in complementary distribution. Three indicate contexts in which they both occur but the definite article does not. Five indicate contexts in which neither a nor one occur but the definite article does. The other two are contexts in which neither a, one (nor the) may occur. From these Perlmutter has tried to show that the restrictions on a are stated quite simply assuming that one underlies it. He also indicates some of the rules which provide for the appearance of both a and the (e.g., one is reduced to a when it is an unstressed proclitic; the is obligatorily attached to an NP which has a RRel).

Much, but not all, of Perlmutter's evidence is accounted for in our grammar by a rule (see PRO) which derives one from a (in the same contexts where my → mine, etc.). The two chief objections that we have to his analysis are the following:

(i) Within his analysis, the feature [DEF] is optional, and so are the numerals (which can appear with count nouns only). But then it would appear difficult, if not impossible, to state that with a singular count noun it is obligatory to choose at least one of them. This objection at least counterbalances his claim to have a non-ad-hoc explanation of the distribution of a/an.

(ii) If the numerals occur only with count nouns (which is central to his argument), then problems arise in relating numerals to other quantifiers. Many behaves in all relevant respects like a numeral, but it differs from much only by its co-occurrence with count vs. mass nouns. The similarity between many and much cannot be captured without including much in the same category, but this of course would refute the claim that that category occurs only with count nouns. Similar problems arise for quantifiers like some which occur freely with both mass and count nouns.

There are parts of Perlmutter's evidence for which we have no account, but these seem relatively minor compared with the preceding arguments. They include the following facts:

(i) Only numerals and a can be the first part of a fraction.

(ii) Only one and a can occur in certain idioms, e.g. not a bit. Other evidence which he adduces is either accounted for on other bases in our grammar or else considerably more indirect and debatable.

Since Baker's (1966a) paper is a preliminary version of his (1966b) thesis, we shall consider them together.

Baker makes three major claims in (1966b). (1) All indefinite NP's have existential sentences as their source. (2) There is a large, well-defined set of definite NP's in which the definite article is a marker of the presence of an existential sentence, in the same or previous tree, containing the same noun. (3) [-SPEC] articles arise when certain embedding rules delete previously existing reference markers.

Baker's primary motivation for his claim that indefinites are to be derived from existential sentences is to illuminate the difference between [ $\pm$ DEF] with respect to sentence negation. We have crucial differences of opinion regarding the data which Baker bases his argument on. For example, we see no difference in grammaticality between (1) and (2), the second of which he considers ungrammatical.

- (1) (a) The halfback didn't run with the ball.  
[Baker, (1.b) p. 14]
- (b) John didn't see the salesman. [Baker, (2.b) p. 14]
- (2) (a) A halfback didn't run with the ball.  
[Baker, (1.d)]
- (b) John didn't see a salesman. [Baker, (2.d)]

Baker contends that (3.a,b) are negations of (4.a,b), and that (2.a,b) are not. In our analysis, however, (4.a,b) are considered ambiguous with the indefinite article either [ $\pm$ Specific] (see below and also NEG, with (2.a,b) the negation in the case of [ $\pm$ Specific], and (3.a,b) the negation for [-Specific].

- (3) (a) No halfback ran with the ball.
- (b) John saw no salesman or John didn't see any salesman.
- (4) (a) A halfback ran with the ball. [(1.c)]
- (b) John saw a salesman. [(2.c)].

Baker's claim that some definite articles are transformationally derived will be taken up in the following section on definites, as will the claim re: specific under the Specific section (II.A.5).

In (1966a) Baker himself raises some problems for his position on indefinites. It should also be noted that a crucial technical problem is present in his T which is supposed to convert existentials into indefinites, namely, the T does not insert an ART.

Sentences with more than one indefinite NP would seem to raise other problems for Baker's analysis. Thus, a sentence like (5) either has no source (since endless recursion might be required with the existential S's) or a number of sources (since various stackings of existentials would be possible).

- (5) A man gave a man a nickel.

Under Baker's analysis, existentials themselves arise from a special PS rule.

Baker notes that Sørensen (1959) and Lees (1961) have also suggested an existential source for indefinites.

### 3. Definite

#### (a) Orientation

Views on definiteness are widely divergent. Some writers (e.g., Smith, 1961b) have given the impression that the comes solely from lexical insertion. Later authors have contended that all instances of the arise transformationally (e.g., Robbins, Annear). Still others (e.g., Postal 1967) have taken the position that the definite article arises from both the base and from T's.

Some complexity has been added by the switch from looking at articles as non-decomposable lexical items to considering them composites of features (one feature of which is [DEF]). Assuming (some) definite articles arise from T's, under the non-decomposable view definitization consists of replacing a by the. Under the feature viewpoint, definitization involves changing the specification of the feature [DEF] to +.

The feature analysis permits the relating of the definite article the to other articles also obviously definite (e.g., relative, demonstrative, and personal pronouns).

Viewing definitization as applying either to units or to feature composites, it is possible to consider it either as a part of various T's (such as pronominalization and relativization) (cf. PRO, REL) or as a single separate definitization T (cf. Kuroda, 1967a).

In considering the sources of definite articles, there are several distinct types of uses of them to be considered, not all of which will necessarily have the same analysis. The following examples are clear cases of three types.

#### (i) Anaphoric (within a sentence)

- (6) I saw a cat in the tree this morning, but when I looked this afternoon the cat was gone.
- (7) A boy and a girl were walking down the street together, and the girl was shouting at the boy.



(ii) Definite description with relative clause

- (8) The boy who gave me this book wants it back tomorrow.
- (9) The new teacher seems to be very popular already.

(iii) Non-linguistically anaphoric

- (10) Did you wind the clock?
- (11) The cat is on the mat.
- (12) The moon is full tonight.

We would not want to suggest either that these three types of uses exhaust the significant classifications, or that the lines between them are easy to draw or to justify. Sørensen (1959) for example, apparently considers all uses of the definite article to be instances of type (ii), with deleted relative clauses of specified types underlying (i) and (iii). A similar position is taken by Vendler (1968) (cf. discussion below).

It is also possible to consider that type (i) is simply a special case of type (iii), i.e. that there is the same process of anaphora in both, and it is a relatively superficial matter whether the antecedent happens to be in the same sentence or not.

Some transitional cases are illustrated in the following examples.

- (13) I saw a cat in the tree this morning.  
This afternoon the cat was gone.
- (14) I saw a cat in the tree this morning.  
...(intervening discourse) This afternoon the cat  
that I saw in the tree this morning was gone.
- (15) A boy with long hair and a boy with short hair were  
arguing, and the boy with long hair appeared to be  
winning.

Example (13) would presumably be treated in the same way as sentence (6) in a discourse grammar, but in a sentence grammar it must be treated either like sentence (12) or as having a deleted relative clause or preceding conjoined sentence.



Example (14) shares characteristics of types (i) and (ii), and has led some authors (e.g. Vendler (1968) following Robbins) to postulate the relative clause in the second part of (14) as part of the underlying structure of the corresponding definite NP in (6). (Note the difficulty posed for such an analysis by (7) if the relative clause is to be directly related to the clause in which the antecedent appears.)

Example (15) shares characteristics of types (i) and (ii) in a different respect, in that the definite NP appears to be anaphoric but the postnominal modifier cannot be deleted, so that the NP has the form of a definite description.

The anaphoric use of the definite article will be discussed further in PRO, and most of the arguments for and against its transformational derivation in that use will be deferred to that section. We include here some of the discussion of various authors' views on it, since it is not readily separable from other aspects of their treatment of definite article.

#### (b) Critique of Positions

Smith (1961b), working with a non-feature analysis and concentrating on the co-occurrences of articles and relative clauses (both restrictive and appositive), split the DET's into three groups: (1) indefinite (any, a, every, etc.) which occur only with RRel's; (2) specified (a, the) which occur with both RRel's and NRRel's; and (3) unique (the, proper names) which occur only with NRRel's. She does recognize the need for a [<sup>+</sup>DEF] distinction within group (2) but does not deal with it in regards to relatives. Smith proposes a complex subclassification within PS rules trying to capture these restrictions. That is, all articles, definites included, are introduced through the PS rules.

Her analysis has the unfortunate consequences of (a) introducing generics in two places under DET and (b) requiring the inclusion of the within group (1) since proper names with the can only take RRel's. Her subclassification seems to collapse when a, the, and proper names are shown to occur with both RRel's and NRRel's. Her observation that some quantifiers disallow NRRel's (or vice versa) is well made.

To put this critique another way, we disagree with the position that determiners should or can be distinguished solely on the grounds of their interaction with relative clauses.

A more fundamental objection to the view that definite articles are all introduced in the base has arisen with the widespread acceptance of the view that the semantic interpretation should be determinable from the base structure and that coreferentiality is part of semantic interpretation. Under these assumptions, the following sentences indicate that at least anaphoric definite articles should be transformationally derived.

- (16) Someone called a boy to the telephone while the boy was talking to a pretty girl.
- (17) While a boy was talking to a pretty girl, someone called the boy to the telephone.
- (18) Someone called the boy to the telephone while a boy was talking to a pretty girl.
- (19) While the boy was talking to a pretty girl, someone called a boy to the telephone.

Deep structure introduction of definite articles would assign identical deep structures to (16) and (19) and to (17) and (18); but under the assumptions stated above, only (16) and (17) should have a deep structure in common, since only in those sentences can the NP's with boy be interpreted as coreferential. Those in (18) and (19) cannot be.

At the opposite extreme, Annear, Robbins, and Vendler have contended that all instances of the are transformationally derived. We believe that such a view leads to an impasse within a sentence grammar. T's would have to be permitted on domains larger than a single sentence. Shopen (1967), Wolfe (1967), and others have shown that antecedents relevant to definitization are sometimes not only non-locatable but also linguistically non-existent. (Cf. (10), (11), (12).)

Annear (1967) has tried to sidestep this problem by assuming that every appearance of a definite article must be in the second part of a conjunction, the first part of which may be deleted (at the speaker's discretion) leaving an anaphoric semi-sentence. I.e. she attempts to bring all antecedents into the linguistic context.

Dean (1966) suggests a similar way out; i.e., one might claim that all occurrences of the definite article depend on an implicit relative clause which ensures uniqueness and hence definiteness.

Dean wisely rejects her proposal (and implicitly Annear's), noting the problems of (1) infinite ambiguity of underlying relative or conjoined clauses and (2) vagueness in what the features in

the non-verbal environment are which will specify an object as unique. She points out that the hearer's linguistic competence recognizes that some unique object(s) is intended by the speaker when he uses the definite article. Determining which object is being referred to is a skill only partially linguistic. The logical conclusion is that the SD of the definitization T would have to include non-linguistic material.

Dean retreats to a position she considers more defensible, namely, that the definite article in sentences with a relative clause can be predicted on purely syntactic grounds. (She is not claiming that all sentences with definite articles have relative clauses.) We shall return to her position in discussing relativization and definitization.

Robbins (1962 and 1963) has written two lengthy papers dedicated to the proposition that all definite articles are derived. "Kernel" sentences have only indefinite articles. The bulk of her papers is concerned with showing how various T's (e.g., relativization, adjectivalization, genitivization, nominalization, and anaphora) change the kernel indefinites to derived definites. (Her perspective is that of the Harrisian T school.)

Vendler (1968) claims that all definite articles arise through the process of relative clause formation, and the existence of definite NP's without relative clauses is accounted for by postulating deletability of a relative clause which is identical with a preceding sentence. No formal account is offered for the fact that NP's with relative clauses need not end up definite, however.

As we have intimated, we feel that although the quest for a transformational derivation for all the's may have semantico-philosophical justification, it cannot be supported on linguistic grounds within the framework of a sentence grammar. Within such a framework, it appears to us preferable to leave the interpretation of the in examples such as (10)-(12) to the semantic component.

Since the third position incorporates both base and T derivation of definites, we shall provide arguments relevant to both of the foregoing views as we discuss it.

Among proposals for deriving only some definite articles by T-rules, some are primarily concerned with anaphora and others with definite descriptions with relative clauses. The former are discussed further in PRO, the latter in REL. We include only a few brief remarks here.

There are some sentences which indicate that definitization is involved with pronominalization. In pronominalization, when coreferentiality is not intended the indefinite one is employed. Cf.

- (20) She saw a criminal and shot one.
- (21) She looked at a puppy and bought one.

If the speaker wants to express coreferentiality, the pronoun must be him or it [+DEF] regardless of whether the preceding NP is [+DEF]. Cf.

- (22) She saw a/the criminal and shot him.
- (23) She looked at a/the puppy and bought it.

One interpretation assumes that the second NP is indefinite in the deep structure. However before (or as) pronominalization operates the second NP is made definite.

One view of pronominalization holds that definitization is a part of pronominalization of coreferential NP's. Another (cf. Kuroda, 1967a) holds that definitization is a separate T dependent on coreferentiality and preceding pronominalization in the T cycle. The burden of coreferentiality is thus removed from pronominalization.

The latter view has the advantage of collapsing a recurring phenomenon which would have to be stated separately for relativization, nominalization, genitivization, and pronominalization.

Note that the anaphoric use of the does not always involve formally identical nouns.

- (24) I saw a boy flying a kite on a very windy day and the little fellow was almost being pulled off the ground.

If all anaphoric definite articles are to be uniformly derived by T-rules, such examples suggest that referential identity will require an apparatus considerably more complex than just an indexing of nouns. The same conclusion is suggested by such examples as the following:

- (25) John, Bill, and Mary all set out at noon, but only the boys got back by dinner time.



- (26) John and I started arguing yesterday, and the argument is still going on.
- (27) A prince and a princess were married and then driven apart by a wicked witch, but finally the couple was (were) reunited and lived happily ever after.

Turning to the relevance of definitization for relativization, we note that it has bearing on both the matrix NP and the constituent NP. Definitization of the constituent NP is discussed in Kuroda (1966) and in a section of REL. A brief recapitulation is in order here. Under the NP--S analysis discussed in REL, in which NP's are identical, sentences like (28) require both articles to be [-DEF] in the deep structure.

- (28) The car struck a child that ran out into the street.

However, in every constituent sentence the ART to which WH is attached must be definite before WH-pronominalization to guarantee that its result is a definite relative pronoun, i.e., who, which, or that rather than what. In sum, definitization during the relative operation is one way to insure the conversion of constituent non-definite articles to definite status. Otherwise, an ad hoc feature [+REL] would be required, missing the fact that the relative pronouns already form a natural class.

Kuroda justifies the possibility of transformational derivation of definite articles primarily with arguments about anaphora, using examples like (16)-(19) above. In his relative clause analysis, he allows all four possible combinations of definite and indefinite articles in matrix and constituent; both definite leads to non-restrictives, both indefinite to "whoever"-type structures. If the two articles have opposite values a restrictive relative results with the matrix NP keeping its original article; in any case a definitization transformation applies to the embedded one to account for the form of the relative pronoun.

Kuroda proposes the following T which definitizes the constituent DET.

$$(29) \quad N_1 - X - \text{DET} - N_2 \longrightarrow N_1 - X - \text{THAT} - N_2 \quad [25]$$

Cond:  $N_1 = N_2$  (coreferential)

In regards to the matrix NP, Dean (1966) suggests that a similar definitization T operates converting the matrix article to the when the head Noun is marked as having unique reference. This marking arises when the constituent determiner is some (particular)--apparently equivalent to our [+SPEC]--and derivatively the. By applying the feature [+UNIQUE] to some (particular) and the, Dean states the matrix definitization T as follows.

$$\begin{array}{l}
 (30) \text{ SD: } X - \underset{1}{\text{DET}} - \underset{2}{N_1} - \underbrace{S \left[ \text{WH} - \left[ \underset{3}{\begin{array}{c} \text{DET} \\ +\text{UNIQUE} \end{array}} \right] - N_1 - X \right]} \\
 \text{SC: } 1 - \left[ \begin{array}{c} 2 \\ +\text{UNIQUE} \\ +\text{DEF} \end{array} \right] - 3
 \end{array}$$

Baker (1966a & b) has suggested that the is inserted transformationally when an underlying existential sentence is embedded within the DET. Thus (32) is derived from (31).

- (31) ART #there was a girl Anderson kissed#girl called the police  
 (32) The girl that Anderson kissed called the police.

In his account, anaphoric the as in (34) arises from the same source by the deletion of the relative clause; he suggests that an embedded existential relative clause can be deleted when it is identical to some previous existential sentence in the discourse. Thus (34) can be derived from (32) if sentence (33) precedes (32) in the discourse.

- (33) There was a girl Anderson kissed.  
 (34) The girl called the police. [Baker (1966b), (8.b), p. 18]

Baker's analysis is closely related to that proposed by Vendler (1968) for all occurrences of the definite article. Baker, however, claims that relativization is only one of several sources for definite articles.

The most obvious problem with such an analysis is the fantastic embedding problem which arises for the last sentence of a discourse about "the girl". Intuitively the definitization does not involve all that is said about "the girl" but simply her (co)referentiality. Baker notes this fact also and reduces the requirement for definitization to there being an identical coreferential N in a preceding existential sentence.



Kuroda (1966b) claimed that definitization (though not pronominalization) was possible in certain adverbials on the basis of examples like (35)-(37).

(35) That was the manner of disappearing John described to Mary, and he actually disappeared in that manner. [95]

(36) That was the day John told Mary he would disappear, and he actually disappeared on that day. [96]

(37) \*That was the day John told Mary he would disappear, and he actually disappeared on it. [98]

But, as noted in PRO (II.D.5), sentences like (35) and (36) with the in place of that are ungrammatical, and the is possible only with a relative clause present. Thus (35) and (36) do not appear to be cases of anaphoric definitization. Exactly what that in these examples is is not clear.

(38) \*That was the day John told Mary he would disappear, and he actually disappeared on the day.

(39) John disappeared on the day on which he had said he would.

It would seem that the definite article usually indicates co-extensiveness with a particular set. In the case of the anaphoric definite article, the NP is assumed to be coextensive with that previous NP which caused the definitization, whether within a sentence, as in type (i), or extra-sentential or perhaps even non-linguistic, as in type (iii). In type (ii), where the definite article occurs with a relative clause, then the relative clause defines the set. For instance, in (9), the implication is that there is only one new teacher. If the sentence were pluralized, then the number of new teachers would be unspecified, but the implication would be that all the new teachers (i.e. the total set) were already very popular. It is not at all clear how it would be possible to represent this in the deep structure (and cf. PRO II.C.3 for further discussion).

The fact that some occurrences of the definite article are obligatory does not really provide any justification for any one of the above positions. Nevertheless we should note such obligatory

contexts. The definite article is obligatory when it is: (a) accompanying superlatives (cf. 40), (b) accompanying other quantifiers such as same, only, next which require a unique noun (cf. 41), and (c) in certain idioms (cf. 42).

- (40) the/\*a best way to get home
- (41) the/\*a same day
- (42) beat around the/\*a bush

If a base derivation is assumed, cases (a) and (b) would be assumed by a contextual feature. If a T derivation is assumed, a fairly idiosyncratic T would be added. (c) will be a lexical problem under either assumption.

Oriented toward exploring the relationship of proper nouns and determiners, Sloat (1968) discusses the presence of the definite article the but not its origin. He points out that articles operate identically with proper and countable common nouns except that the definite article is zero before singular proper nouns (unless heavily stressed or in the presence of a relative clause). His point that proper and common nouns are very similar is well made. His observations regarding the absence of the are handled within the UESP grammar by a late T-rule deleting the before proper nouns which have no additional modifiers.

Although we agree strongly in principle that at least some definite articles arise transformationally, we have not included a definitization rule but are simply choosing definite and indefinite articles freely in the first lexical lookup. The reason for this is that an adequate formulation of such a rule would appear to require a considerably enriched theory, and it seems more reasonable within our framework to omit the rule entirely than to try to give an ad hoc formulation of it.

#### 4. Generic

##### (a) Delimitation of the Term

The term "generic" has been used in a number of constructs.

##### (i) Generic Person

Jespersen (Essentials, p. 150f) speaks of a generic person which vaguely comprises all persons. It is represented on the surface by one, he, his, himself, you, and we.

- (43) One always finds himself embarrassed when he is in a situation which highlights his stupidity.
- (44) You can never tell about such things.
- (45) We live to learn.

(ii) Generic Present

Jespersen (MEG IV, 2.1) also distinguishes generic and non-generic present tense (though not with great categorical certainty. He proposes a graduated continuum between the two.) Non-generic present is exemplified by (46) and generic present by (47).

- (46) He is ill.
- (47) None but the brave deserves the fair.

Syntactic evidence of the distinction may be present in tense agreement in indirect quotation in some dialects. For Chapin (1967), non-generic tense requires tense agreement while generic does not. Viz.,

- (48) He told us that Ellen was writing/\*is writing a letter.
- (49) He told us that Ellen ?wrote/writes books.

(iii) Generic Restrictive Relative

Further, Jespersen (MEG, 5.1ff) applies the term generic to some RRel's which occur with personal and demonstrative pronouns. Viz.,

- (50) He that fights and runs away may live to fight another day.
- (51) Those who live by the sword will die by the sword.

(iv) Generic Articles

Finally, Jespersen (Essentials, pp. 212-14) uses the terms "generic number" and "generic article". This is the use of "generic" relevant to the present paper and will be expanded on in the following sections.

Chapin (1967, pp. 30-7) has reviewed each of the above uses and related them to one another. His conclusion is that genericness is not a characteristic of nouns or verbs but of sentences. He considers it a mood like IMP which determines which base structures are admissible. Admitting the possible fruitfulness of such a position for further investigation but cognizant of the complete absence of work presently done in this area, we restrict the use of "generic" here to NP's and introduce it as a feature on ART.

(b) Characteristics of Generic Articles

Jespersen (1933, pp. 212-14) notes that an assertion may be made to apply to a whole species or class, explicitly by the use of every, any, or all, or implicitly by certain combinations of definite/indefinite article with singular/plural nouns.

(i) No article, singular: used with mass nouns, man, and woman.

(52) Blood is thicker than water.

(ii) Indefinite article, singular: "it may be considered a weaker any" (Jespersen, p. 213)

(53) An oak is hardier than a beech.

(iii) Definite article, singular

(54) The early bird catches the worm.

(iv) No article, plural

(55) Owls cannot see well in the daytime.

(v) Definite article, plural: used chiefly with adjectives (the rich, the old, etc.), and in scientific or quasi-scientific descriptions.

(56) The owls have large eyes and soft plumage.

The fifth usage, i.e., the with plurals, is not widespread if acceptable at all. Note that (57) is not generally understood generically.

(57) The elephants are huge animals.

In sum, the surface forms of generics are a, the, and  $\emptyset$ .

It has been suggested by Smith (1961b) and others that any is also a realization of generic. Cf.

- (58) (a) An owl sees poorly in daylight.
- (b) Any owl sees poorly in daylight.

Perlmutter (1968) has shown that any and generic a have a great deal in common. He particularly points out (fn. 10) that these two items have many restrictions in common which are not shared by the other generic articles. We repeat his arguments and examples below.

(a) Any and generic a can not undergo conjunction reduction with and. The other generics can.

- (59) \*A/any beaver and an/any otter build dams.  
     [ix, xi.a]

- (60) (a) The beaver and the otter build dams. [vii]
- (b) Beavers and otters build dams. [viii]

(b) Any and generic a do not occur in the Agent NP of a passive sentence. The other generics do.

- (61) \*Dams are built by a/any beaver. [xiii, xiv]

- (62) (a) Dams are built by the beaver. [xii.a]
- (b) Dams are built by beavers. [xii.b]

(c) Any and generic a can not occur in of-constructions like the following.

- (63) \*I said of a/any beaver that it builds dams.  
     [xvi, xvii]

- (64) (a) I said of the beaver that it builds dams. [xv.a]
- (b) I said of beavers that they build dams. [xv.b]

(d) Any and generic a can not occur with items predicated of an entire group or class. The other generics can.

- (65) (a) \*A/any beaver is found in Canada. [xxi.a, xxii.a]
- (b) \*A/any beaver is extinct. [xxi.c, xxii.c]

- (66) (a) The beaver is found in Canada/is extinct.  
     [xviii.a, xx.a]
- (b) Beavers are found in Canada/are extinct.  
     [xviii.b, xx.b]

(e) Any and generic a cannot occur with progressives while the others can.

(67) \*A/any beaver is building dams these days.  
[xxiv, xxv]

(68) (a) The beaver is building dams these days.  
[xxiii.a]

(b) Beavers are building dams these days.  
[xxiii.b]

(f) Any and generic a do not occur with past tense (the others do).

(69) \*A/any beaver built dams in prehistoric times.  
[xxvii, xxviii]

(70) (a) The beaver built dams in prehistoric times.  
[xxvi.a]

(b) Beavers built dams in prehistoric times.  
[xxvi.b]

Smith (1961b) suggests two other syntactic phenomena which distinguish the generic possibilities.

First, generic a accepts only RRel's and generic the only NRRel's, according to Smith. There are some apparent counter examples, although the generalization seems basically valid.

(71) An eagle, which is the national bird, is generally seen only by zoo visitors.

(72) An owl, which can see in the dark, can pounce on a rabbit from a great distance even on a moonless night.

For some slight counterevidence to the occurring only with NRRel's, see our comments below on Postal, reference, and generics. Note also that plurals with Ø article can have either R or NRRel's.

(73) Snakes, which move with deceptive speed, are one of the most feared animals.

(74) Snakes which shed their skins annually are sometimes poisonous.



Second, according to Smith a is restricted to non-past while the has no such restriction. Once again there is some evidence against this proposed distinction, though the bulk of the evidence is favorable.

- (75) (a) A dog is a pet.  
(b) \*A dog was a pet.

BUT: (76) (a) A dog was a pet in ancient times too.  
(b) A book was a rare and valuable possession before the invention of the printing press.

Smith (1964) makes a point which is fundamental to the problem of generics, namely that at least with the generic article the, there are no purely distributional properties which distinguish generic from non-generic. She therefore suggests that genericness might better be viewed as a matter purely for interpretive rules, since there are apparently no distinctions of grammatical/ungrammatical that rest on the generic/non-generic distinction.

It is significant that even though generics indicate semantically a class of indefinite size (i.e., having an indefinite number of members), the surface forms have relevance for number agreement in the verb. Viz.

- (77) (a) A/the dog is a mammal.  
(b) Dogs are mammals.

The relationship of generics and post-articles remains to be investigated.

Postal (1966) has pointed out that generics operate syntactically like definites in some respects. Thus, only definites and generics can occur in sentences like those in (78).

- (78) (a) Big as the boy was he couldn't lift the suitcase. DEF  
(b) Strong as gorillas are, they can't outwrestle Superman. GEN  
(c) \*Big as a giant was, he/one couldn't lift it. INDEF.

Furthermore, generics can be pronominalized by personal (i.e. definite) pronouns (cf. Wolfe (1967)).

- (79) (a) A dog is a carnivore, but it also eats vegetables.
- (b) Milk is nutritious, but some children don't like it.
- (c) Cats are independent, but they are also affectionate.
- (d) The lion is the king of beasts, and all the other animals fear him.

However, ordinary anaphoric definitization does not apply to generics such as (81) as it does with non-generics such as (80).

- (80) (a) A dog and a cat were fighting, and the dog won.
- (b) I offered him some milk and some coffee and he chose the milk.
- (81) (a) \*Milk and eggs are both nutritious but some children don't like the milk.
- (b) \*Cigarettes are more toxic than cigars, but most people still prefer the cigarettes.  
(Ungrammatical as generic.)

Since definitization is assumed to be prerequisite to personal pronoun formation (both by Postal and by UESP), the absence of definitization presents a problem in interpreting the significance of the examples in (79). One possibility is that the pronouns in (79) arise by some other process peculiar to generics, in which case (79) does not constitute any evidence for calling all generics definite. Another possibility is that definitization does take place as in (81), but that the article, being a generic definite, is then realized as  $\emptyset$ , so that the surface forms derived from (81) are simply (82).

- (82) (a) Milk and eggs are both nutritious but some children don't like milk.
- (b) Cigarettes are more toxic than cigars, but most people still prefer cigarettes.

But this suggestion leaves a great deal to be explained in light of the fact that the is also a possible generic article. Note that something very much akin to anaphoric definitization takes place in the following sentences, which if not generic are very close to being so.

- (83) (a) Milk and eggs are both called for in this recipe; the milk provides most of the nutrition and the eggs are for binding.  
 (b) Whenever a dog and a cat fight, the dog wins.  
 (c) In most cases involving a man and a woman, Judge Jones is inclined to rule in favor of the woman.

However, it is not clear that these are true generics despite the "generic tense"; the line between generics and non-specific indefinites is not at all clear, and perhaps the latter are involved here. In any case, (78) and (79) do not, in the face of (81), provide nearly conclusive evidence that generics are definite.

A further difference between definites and  $\emptyset$ -article generics is that only the former occur as subjects of possessives, even though so-called "generic quantifiers" like all and every can occur with possessive.

- (84) (a) The house is John's.  
 (b) \*Swans are the Queen's.  
 (c) All swans are the Queen's.

On the question of the interpretation of generic NP's, Jespersen (1933, p. 212) suggests that generics are used in making an assertion about a whole species or class which is equally applicable to each member of the class. But note that in addition to the problems raised for such a claim by predicates such as extinct and numerous (which do apply to a class or species but not to its members), there is an important distinction between quantified expressions like all men and simple generics like men. The simple generic NP is used of a whole class or species, but does not necessarily implicate every single member as all N does: (85) does not assert that no men are bachelors.

- (85) In our society men marry one wife each.

Generics occur in some constructions in which coreference is generally considered a factor. In order to account for their behavior in such constructions, it seems that we must either consider any two formally identical generic NP's to have the same referents, or else we must interpret generics as non-referential and reformulate obligatory coreferentiality conditions as simply obligatory absence of marked non-coreferentiality. Two relevant constructions are relative clauses and respectively-conjunction. (Pronominalization and anaphoric definitization are also relevant, of course: see discussion above.)

Generic NP's containing restrictive Rel's do seem to occur, although Postal (1966) claims otherwise.

- (86) (a) Dogs that have short tails are unattractive.
- (b) A gorilla that lives in Africa is usually bigger than one that lives in a zoo.
- (c) The gorilla that he is speaking of became extinct long ago.

And as he points out, the preposed adjectives are unquestionably grammatical.

- (87) (a) Short-tailed dogs are unattractive.
- (b) Strong as big men are, the flu will lay them low.

However, it is in cases like (86.a,b) that the distinction between generic and non-specific indefinite tends to become elusive. But there is no obvious distinction in the nature of assertions about dogs vs. short-tailed dogs vs. dogs that have short tails.

Of Postal's counterexamples, one is judged grammatical by a number of speakers if that is substituted for who. Cf.

- (88) Strong as gorillas that live in Africa are, they can't tear down banana trees.

The second counter-example appears to be ungrammatical because of the tightness of the restriction placed on it by the RRel. I.e., it is hard to consider the NP as applying to an indefinite, general subclass. Cf.

- (89) \*Expensive as butter which I bought yesterday was, it turned rancid.

Note that by expanding the subclass it becomes quite acceptable as a generic.

- (90) Expensive as butter which one buys on Fridays is, it usually turns rancid.

Sentences (89)-(90) illustrate the relevance of Jespersen's concern with generic present (vs. past in this example).

A second phenomenon concerning generics and reference is the way they operate in conjunction reduction and respectively insertion. Dogs [+GEN] in (91.a) cannot be interpreted as non-coreferential in the deep structure, i.e., "dogs are mammals and dogs are carnivores". Contrast (91.b) in which those men [-GEN] can be either coreferential or not in the underlying structure.

- (91) (a) Dogs are mammals and carnivores.  
 (b) Those men are plumbers and electricians.

A syntactic reflex of coreferentiality (or absence of non-coreferentiality) of generics is the fact that respectively cannot be used with generics unless they are formally different. The obvious deduction is that since respectively occurs only with non-coreferential items, generics cannot be non-coreferential: i.e., they must be considered either coreferential or else nonreferential altogether.

- (92) \*Dogs are mammals and carnivores respectively.

#### (c) Source of the Generic Article

Under the assumption that the various types of articles (generic, definite, indefinite, etc.) are plugged into different terminal categories one would have the following choice for the generics.

First, present when no determiner is chosen. E.g.,

NP → (D) N (S)

Second, as an alternative to DET. E.g.,

NP → { D } N (S)  
           { GEN }

Third, as an alternative to ART. E.g.,

D → { ART } (POST)  
           { GEN }

Fourth, as an alternative to DEF/INDEF. E.g.,

ART → { GEN }  
           { DEF }  
           { INDEF }

Fifth, as a subtype of DEF. E.g.,

DEF → { GENERIC }  
           { SPECIFIC }

Thomas (1965) chose alternative 3. The present analysis represents a variant of the fifth. Generics are considered one realization of the subclass [+DEF] of the category ART.



Assuming the source for articles to be feature complexes, there is still the possibility of allowing feature changes so that one underlying article is changed to a different surface article. Postal suggests such a thing vaguely when he says that some generics which start out [+DEF] become [-DEF] on the surface. He uses the questionable (cf. above) RRel argument to argue that what are generics without RRel's turn into indefinites with a RRel. The UESP disallows any such switch. What begins as generic ends as generic. No significance is attached to the surface form similarity of generic a and indefinite a, although as we pointed out above, there are cases where the generic seems more like a non-specific indefinite than like a definite. No contextual restrictions have been put on generic articles. The analysis should be considered highly tentative, since many of the arguments discussed above are unresolved.

## 5. Specific

The feature [SPEC] is used as Fillmore (1966d) used it. He has given the following illustration of the feature's relevance. If the some in (93) is [+SPEC] then the speaker is asserting that certain specific friends of his speak French.

(93) Some of my friends speak French.

If it is [-SPEC] the sentence indicates simply that the speaker has friends who speak French.

[SPEC] has surface structure relevance in that only [-SPEC] articles are candidates for undergoing some-any suppletion and hence any-no suppletion. Thus, the [±SPEC] distinction is clearer both semantically and syntactically in negative sentences. Looking at sentence (93) again, the negation of the [+SPEC] interpretation is (94.a).

(94) (a) Some of my friends don't speak French.

The negation of the sentence with the [-SPEC] article is (94.b)

(94) (b) None of my friends speak French.

The same feature is responsible for the difference in the following sentences with many.

- (95) (a) Not many of them understand the protocol. [-SPEC]  
 (b) Many of them don't understand the protocol.  
 [+SPEC]



[SPEC] also has surface relevance indirectly in pronominalization. Normally, only the [+SPEC] article allows coreference. Viz.,

- (96) (a) I asked the lady for a nickel [-SPEC] and she gave me one.  
 (b) I asked the lady for a nickel [+SPEC] and she gave it to me.

However, Baker (1966.a,b), Karttunen (1968), and Dean (1968) have all discussed examples of the type first pointed out by Baker, in which pronominalization can occur even if the antecedent is [-SPEC].

- (97) John wants to catch a fish and eat it for supper.

This contrasts with (98), in which the antecedent can only be interpreted as [+SPEC].

- (98) John wants to catch a fish. You can see it from here.

There is a great deal of work going on currently on this and related problems from many different points of view, the most recent of which is not included in our bibliography. One consideration which presents a problem for the feature [SPEC] is the fact that semantically, the distinction marked in negative sentences, i.e. (94.a,b) or (95.a,b), is not always the same as that marked in "opaque contexts" such as wants--, is looking for--, etc. For example, (99.a) below is ambiguous with respect to whether specific girls are meant or not. And when a negative is in the matrix sentence, the some-any distinction does indeed seem to parallel the two senses of (99.a).

- (99) (a) The teacher expects some of the girls to pass the test. [ $\pm$ SPEC]  
 (b) The teacher doesn't expect some of the girls to pass the test. [+SPEC]  
 (c) The teacher doesn't expect any of the girls to pass the test. [-SPEC]

But when the negative is in the embedded sentence, the some-any choice seems to cross-cut the ambiguity of (99.a), since (100.a) is still ambiguous in exactly the same way as (99.a).

- (100) (a) The teacher expects some of the girls not to pass the test. [+SPEC]? [ $\pm$ SPEC]?  
 (b) The teacher expects none of the girls to pass the test. [-SPEC]

Example (100.a) indicates that the single feature [ $\pm$ SPEC] is not sufficient to mark both kinds of distinction, yet from examples like (99.b,c) and (100.b) it would appear that setting up two independent features would lead to a great deal of redundancy in their choice.

Further indication of the insufficiency of a single feature for marking the ambiguities that exist in opaque contexts is provided by examples such as the following.

(101) John thinks Mary wants to marry a hippie.

If a hippie is interpreted in the [-SPEC] sense, it is presumably part of Mary's wish that the descriptive term "hippie" apply to the one she marries. However, in the [+SPEC] sense, it seems that the descriptive term "hippie" may be attributable to Mary, to John, or to the speaker of the sentence. Such matters have been discussed in the philosophical literature for some time, and are now beginning to make their way into linguistic concerns. The linguistic work, however, is too recent to be included here, and the philosophical references have been omitted because they are in entirely different framework.

As mentioned above, Dean (1966), in proposing to derive the definite article the from indefinites in a matrix NP having an embedded relative clause, postulated a some(particular) which seems to be identical with [+SPEC].

The features [DEF] and [SPEC] are sometimes confused. Perhaps one reason this is so is that both [+DEF] and [+SPEC] involve a referent (in contrast to (other) indefinites). There seems to be a distinction though in the fact that with [+DEF] the referent is assumed known by the hearer, while with [+SPEC] the speaker makes no such assumption regarding the hearer (in both cases the speaker knows the referent). Cf.

- (102) (a) He needs the book. [+DEF]
- (b) He needs some books. [+SPEC]
- (c) I'm looking for the little boy. [+DEF]
- (d) I'm looking for a little boy. [+SPEC]

The UESP considers [SPEC] to further delimit only the [-DEF] elements. So, in a sentence like (103), specificity has no relevance for the definite NP's; one might alternatively say that all [+DEF]'s are [+SPEC] redundantly.

- (103) John is the teacher you met at the drinking fountain.

However, it could be suggested that insofar as the [ $\pm$ SPEC] distinction is appropriate for capturing the ambiguity of sentences like (99.a), it would likewise be appropriate for capturing the ambiguity in cases like (104) with definite articles.

- (104) (a) John is looking for the man who murdered Smith.  
 (b) John wants to talk to the man who owns the house next door.

In the definite cases, the existence of a referent for the NP is not in question; the ambiguity rather concerns whether John (or perhaps the speaker) has independent acquaintance with referent other than via the given description.

In the present view [GEN] and [SPEC] are non-intersecting. In 1967 (UCLA Syntax Conference), Schane suggested that [+SPEC] and [-SPEC] should be used instead of [-GEN] and [+GEN] respectively.

However, such an identification would pose problems for the three-way contrast of some-any- $\emptyset$  in (105.a,b,c):

- (105) (a) I don't like some books. [+SPEC]  
 (b) I don't like any books. [-SPEC]  
 (c) I don't like books. [+GEN]

There are certainly many contexts in which a distinction between generics and non-specific indefinites is virtually impossible to find (cf. above, A.4) and it is to be hoped that deeper relations between these two phenomena will eventually be found.

## 6. Pronouns

Traditional descriptions of English have considered pronouns and articles as quite different. Articles accompanied nouns while pronouns replaced them.

Early TG also maintained this distinction. Articles were inserted under their own category while pronouns were a subclass of nouns (Chomsky, 1958) and the result of the pronominalization T (Lees and Klima, 1963).

In (1966), Postal proposed that pronouns and articles have the same underlying source. This viewpoint was accepted and modified somewhat by Fillmore (1966d). The present UESP position is close to Fillmore's.

Postal's arguments in favor of treating articles and pronouns alike (i.e., both as segmentalizations of features on the head noun) follow.

(a) The consideration of pronouns as articles allows the element self to be treated as a noun stem. Thus herself is the result of a rule attaching the article her to the noun stem self.

(b) This analysis also allows a parallelism between he/him and himself, I/me/my and myself, it and itself, etc. in regards to animacy, gender, person, etc. Himself is like herself above while him is an article whose underlying head noun has been deleted because it was  $\begin{bmatrix} +\text{PRO} \\ -\text{REFLEX} \end{bmatrix}$ .

(c) The definiteness of the non-derivative pronouns is handled in a natural way since the pronouns will result only if the segmentalized article is [+DEF].

(d) The complementary distribution of pronouns and the definite article the plus one(s) in the presence and absence of RRel's is nicely shown when pronouns are considered articles.

- (106) I met the one who Lucille divorced.
- (107) \*I met him who Lucille divorced.
- (108) \*I met the one.
- (109) I met him.

Thus in the absence of a RRel, one is deleted after the definite article, the latter then being realized as he, she, etc., while in the presence of a relative clause one is not deleted after the article, resulting in the one(s) (that...).

(e) A natural derivation is provided for structures such as we men, you troops, etc., where the surface exhibits the article--N relationship in [+I] or [+II] plurals. Likewise, similar structures occur containing RRel's (both full and reduced).

- (110) You men (who wish to escape)...
- (111) We (honest) policemen...

(f) The article source of pronouns gives a natural account of structures in which pronouns, adjectives and pro-forms all appear together. Viz...

- (112) You great ones...  
 (113) ...us quieter ones.

In these phrases, ones is not deleted because it does not immediately follow the article. (cf. PRO for details of the rules.)

(g) The consideration of pronouns as articles is supported by the appearance in non-standard dialects of the posited underlying forms, i.e., we'uns, us'uns, you'uns, etc. This dialect merely has one less rule than the standard dialect, namely, the non-reflexive pro-stem deletion rule.

(h) A final bit of evidence for treating pronouns like articles is the simplification of phonological statements. The voicing of dental nonstrident continuants is predictable in both articles (the, this, that, these, those) and pronouns (they, them, their, theirs).

## 7. WH

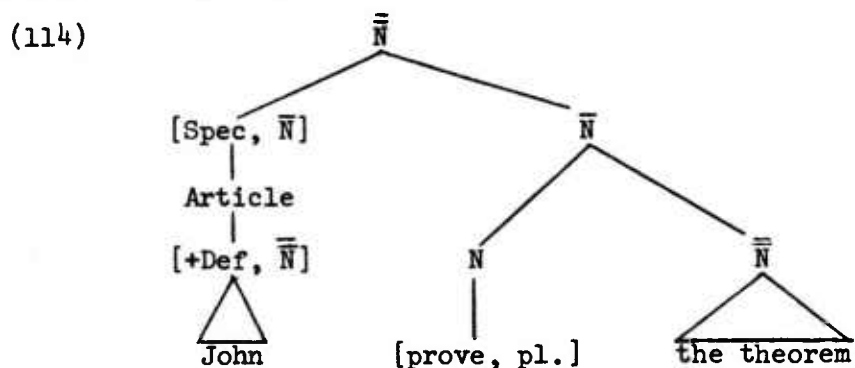
The UESP position on the combination of WH and other features is quite like Kuroda's (1966) in some respects. Kuroda holds that WH + SOME (in our terms, [+WH, -DEF]) is realized as what, while WH + THAT ([+WH, +DEF]) becomes which. Fillmore's (1966) analysis is similar, but differs terminologically (i.e., what is [-DEF, +INTERROG] and which is [+DEF, +INTERROG]) and basically in that relative and interrogative markers appear to be separated.

The UESP differs from Kuroda superficially in the use of features rather than representative symbols (e.g., [-DEF] vs. SOME and [+WH] vs. WH). More importantly, Kuroda asserts that who, where, and when are ambiguously [ $\pm$ DEF]. The UESP and Fillmore consider these unambiguously [-DEF], although the matter is far from clear. See discussion below in III.B.1.d.

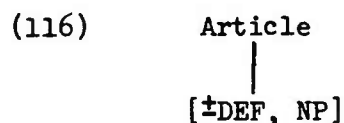
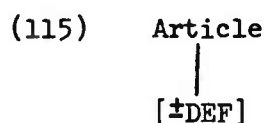
## 8. Genitive

We note here only briefly the relation of genitives to the determiner, since the question is discussed at some length in GEN.

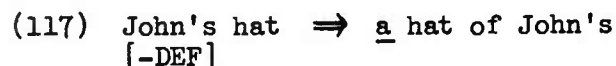
Chomsky (1967) proposed the following deep structure for John's proofs of the theorem.



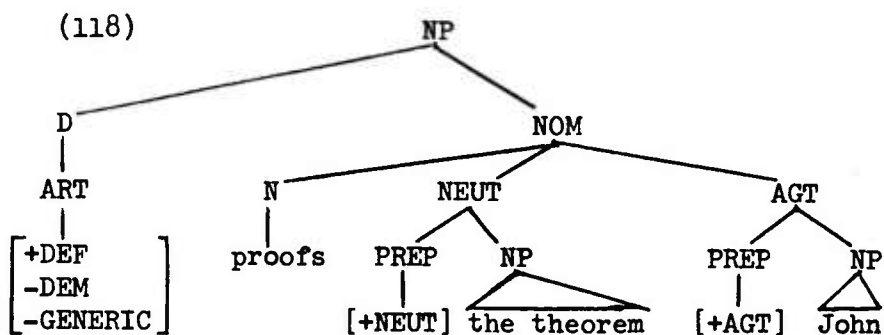
Thus Article has two expansions, exemplified by (115) and (116).



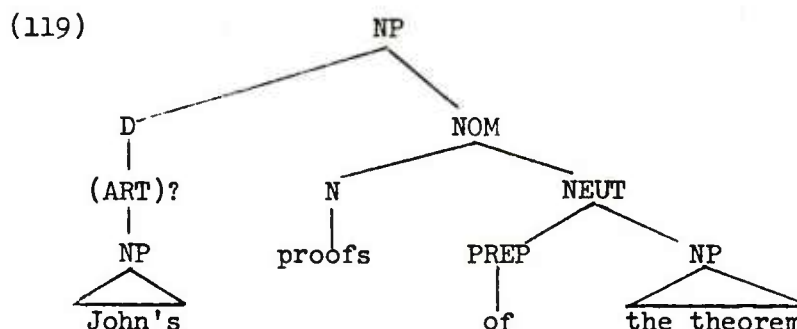
Chomsky's proposal allows the ART to be either a set of features or a full NP which becomes a possessive. If the NP is extraposed the features remain to provide an article. E.g.,



Under the UESP position, a tree similar to Chomsky's deep structure arises in the derivation of some genitives. Thus, (118), which is the deep structure, becomes (119) transformationally.







By adopting the case grammar framework, we are able to capture Chomsky's generalizations about the parallels between NP and S without generating genitives in the determiner: preposed genitives in the NP, like subjects in the S, are positioned by the case placement rules.

With regard to derived structure, there are two main possibilities. Either (1) the genitive NP replaces the article, or (2) the genitive NP is adjoined to the article and the article is subsequently deleted. Relevant arguments are included in CASE PLACE and in GEN.

## B. POST and PART

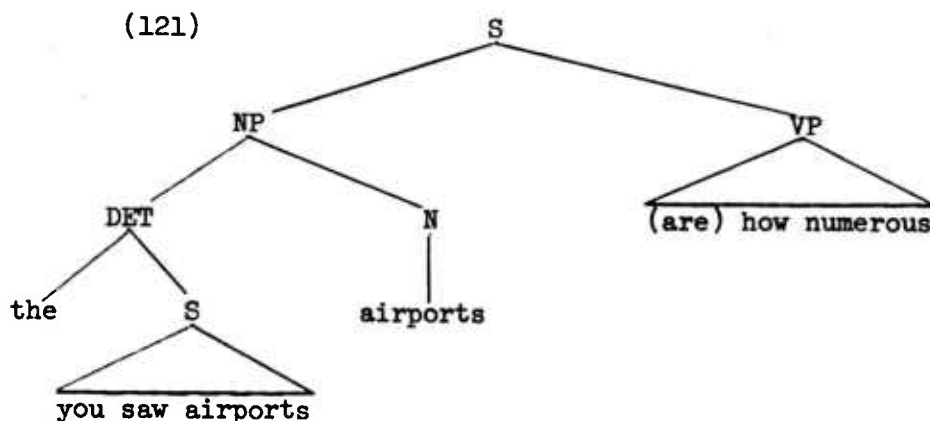
### 1. Quantifiers

The most fought-over bone of contention in regards to quantifiers has been their source. Most transformationalists have considered them to come from lexical insertion into a terminal node dominated by the NP they are associated with. These writers have argued the relative merits of pre-article (Hall, 1962; MITRE, 1965) vs. post-article (UESP; Dean, 1966; Jackendoff, 1968) vs. pre and post article (Hall, 1963a; Chomsky, 1965; Thomas, 1965; Roberts, 1964) sources.

Recently a quite different view has been taken by Lakoff (1965b, Appendix F) and Carden (1967a,b). Lakoff introduces quantifiers as predicates of higher and lower sentences. They are then transformationally inserted into the relevant NP's.

#### (a) The Predicate Source of Quantifiers

Under Lakoff's proposal a sentence such as (120) would have the underlying structure of (121).



Lakoff argues first, that this permits a single source for NP quantifiers such as many, much and measure adjective quantifiers such as long, numerous. Cf.

(122) How long are the airports that you saw?

(123) How many are the airports that you saw?

At the same time it explains the existence of archaisms like (123).

Second, NEG can be associated directly with the quantifiers because of the higher S. This provides for the fact that the interpretation of (124) and (125) do not deny that the soldier was hit but simply assert that he was hit by not much shrapnel.

(124) Not much shrapnel hit the soldier.

(125) The soldier was not hit by much shrapnel.

Similarly and third, Q can likewise be directly associated with the quantifier. This accounts for the questioning of (126) and (127) to be of the amount of shrapnel which hit the soldier, not of whether or not it hit him.

(126) Did much shrapnel hit the soldier?

(127) Was the soldier hit by much shrapnel?

Jackendoff (1968b) has given several arguments against the predicate analysis: (1) Assuming that quantifiers are verbs disallows an explanation of the similarities of quantifiers and the constructions involving group, herd, gallon, etc. The latter are obviously nouns since they can be pluralized and counted. (2) Sentences like (128) in which quantifiers occur alone as pronouns would require two dummy NP's in their deep structure.

(128) Some seem to be quite content.

(3) The fact that quantifiers (e.g., each) influence number agreement suggests that they are not inherently verbs. (4) The similarity of the pronoun one and the quantifier one is not easily shown if the quantifier is a verb. These arguments are concerned with relatively superficial structure, however, and are therefore not fully convincing.

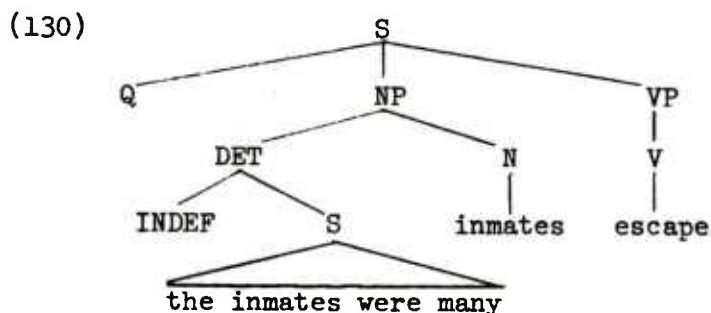
Further arguments for and against Lakoff's position have been developed in Partee (1968). We incorporate verbatim a part of that paper below (reordered and with the examples renumbered).

(Lakoff has replied at length to these arguments, defending some parts of his analysis and revising others, in a paper received too recently to be included here, "Repartee" (1968), to appear in Foundations of Language.)

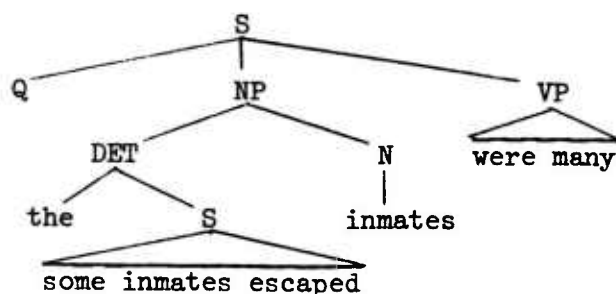
Lakoff claims that sentences containing quantifier predicates may occur as either matrix or constituent with other sentences, with the same surface result but different semantic senses. Thus for the sentence

(129) Did many inmates escape?

he suggests two deep structures:



(131)



Sentence (129) is asserted to be ambiguous in a way captured by the structures (130) and (131). The ambiguity itself is marginal, and the structural distinction proposed to account for it is called into question by some other evidence.

Lakoff claims that any noun phrase can have a quantifier embedded within it, but that only (surface) subject noun phrases can combine with a quantifier from the next higher S. The second part of this claim is false under his assumptions, however, since

(132) Does John read many books?

is interpreted as presupposing some book-reading and questioning the many to at least as great an extent as the analogous claim is true of

(133) Do few people read books?

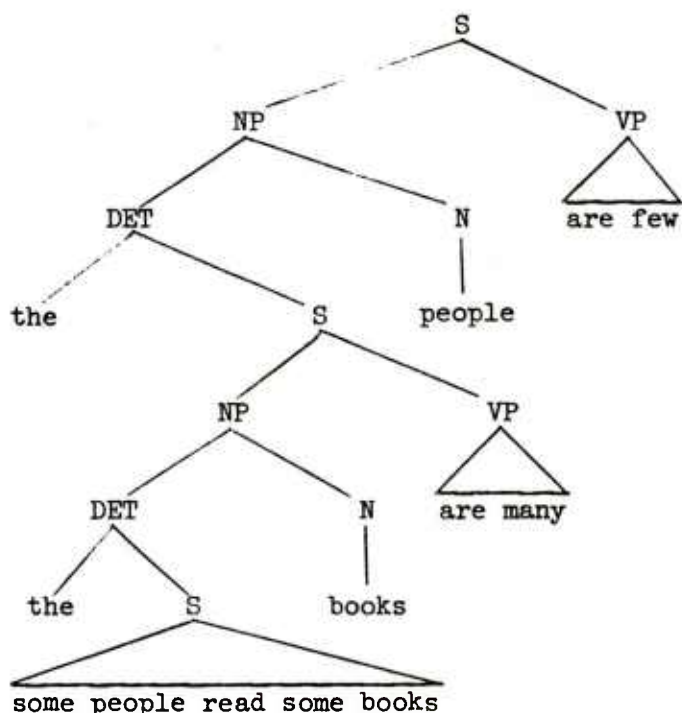
Thus it would appear that his line of reasoning would require the possibility of incorporating a matrix-sentence quantifier into at least both the subject and object noun phrases of embedded sentences.

But this necessary extension leads to a superabundance of available deep structures for certain sentences. Consider the following example:

(134) Few people read many books.

Given that both (132) and (133) can derive their quantifiers from higher S's, it follows that both quantifiers of (134) can come from higher S's. Thus one possible underlying structure for (134), and a semantically plausible one, would be:

(135)



Since the rule which lowers matrix quantifiers into embedded S's is not stated, it is difficult to be certain whether it could apply to a structure like (135). Certainly normal relativization could not apply: a comparable case with ordinary predicates in place of the quantifiers would yield:

(136) \*People who books which read are best-sellers are extroverts.

Sentence (136) is blocked by the Complex-NP Constraint described in Ross (1967). The downward insertion of quantifiers would also seem to be a "chopping rule" and should therefore be subject to the same constraint. But it may be that the product of the rule is not a complex noun phrase and thus that the constraint would not be violated in deriving (134) from (135).

Semantically, (135) is a more reasonable structure for (134) than a structure with one quantifier above the kernel sentence and one below it; however, if lower-S quantifiers are deemed necessary to account for the claimed ambiguity of (129), then there will be five possible deep structures for (134):

- i. (135)
- ii. a structure like (135) with the quantifiers interchanged;
- iii. and iv. one quantifier in a higher S, the other in an embedded S;
- v. both quantifiers in embedded S's.

There may be some dispute as to whether (134) is two ways or three ways ambiguous, but it will hardly be claimed to be five ways ambiguous. It would be reasonable to claim (i) and (ii) as its deep structures, or (iii), (iv), and (v), but not all of them.

The semantic arguments all require the possibility of quantifiers in higher sentences. The suggestion that they also be derivable from embedded sentences was motivated primarily by syntactic arguments; the claim that quantifiers were predicates gained most of its syntactic plausibility from the apparent similarity of behavior of e.g., numerous and many:

- (137) (a) The flowers, which were numerous, were covered with dew.
- (b) The numerous flowers were covered with dew.
- (138) (a) ?The flowers, which were many, were covered with dew.
- (b) The many flowers were covered with dew.

Note that the relative clause of (137) must be non-restrictive; it is not obvious that adjectives like numerous can occur in a restrictive relative clause, or that there is any possible relative clause source for the numerous of

- (139) Numerous animals were driven from the forest.

It may well be true that some quantifiers have essentially the same syntax as quantificational adjectives; but it does not appear that those adjectives share the syntax of ordinary adjectives.

The treatment of quantifiers as predicates (presumably as adjectives or verbs) has at least some plausibility for such quantifiers as many, few, several, and the cardinal numbers, (i.e. for



those quantifiers which can follow the definite article inside a noun phrase), whose predicative use, as Lakoff points out, sounds more archaic than ungrammatical. But there are a number of quantifiers which cannot even "archaically" occur in predicate position; they happen to be just the quantifiers which cannot follow the definite article. Compare (140) and (141):

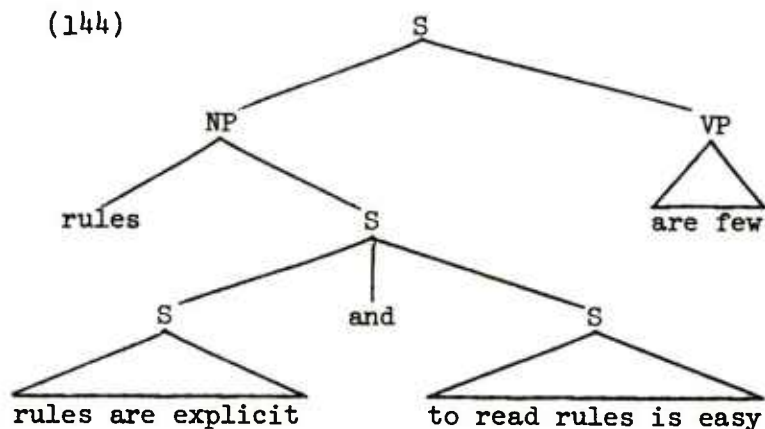
- (140) (a) \*?the arguments are many / the many arguments  
 (b) \*?the arguments are five / the five arguments  
 (c) \*?the arguments are few / the few arguments
- (141) (a) \*the arguments are some / \*the some arguments  
 (b) \*the argument(s) is (are) every / \*the every argument  
 (c) \*the arguments are all / \*the all arguments  
 (d) \*the arguments are none / \*the no arguments

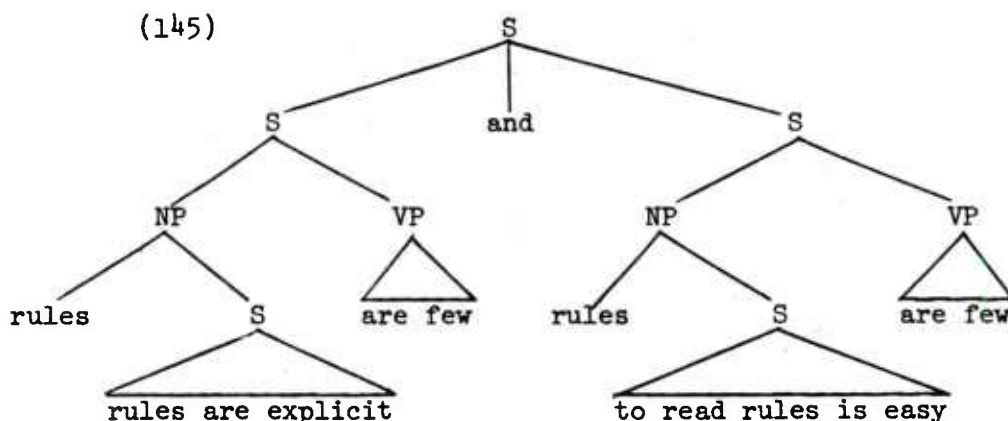
The quantifiers in (140), like the quantificational adjectives numerous, scanty, etc., describe the size of a set. Those in (141), however, describe a certain proportion of a given set and not its absolute size.

But this distinction does not coincide with the synonymy or non-synonymy of pairs like (142) and (143), which would have the underlying structures of (144) and (145) respectively under Lakoff's proposal.

(142) Few rules are both explicit and easy to read.

(143) Few rules are explicit and few rules are easy to read.





If for few in (142) and (143) we substitute many, five, some, or no, we still have non-synonymous sentences; but all or every yield synonymy. Thus the independent syntactic grounds for calling some quantifiers predicates do not lead to the right class of quantifiers with respect to the semantic behavior of quantifiers with conjunction. It would therefore be quite misleading to try to claim independent syntactic justification for structures like (144) and (145) on the evidence of (140).

A semantically consistent approach would require that only also be treated as a predicate. In this case, the counterarguments are even stronger, since not only is only not permitted in predicate position in ordinary sentences (see (146)), but it can modify structures that are by no stretch of the imagination noun phrases, as in (147)

(146) \*The three rules on this page are only

(147) The three rules on this page are only explicit and easy to read (i.e., they are not, for instance, interesting or revealing).

Sentence (147) presents a grave problem for the proposal under consideration. It cannot be maintained that only is a predicate which takes whole sentences as its subject, for then the deep structure of (147) would be identical to that of (148), and the two are clearly not synonymous.

(148) Only the three rules on this page are explicit and only the three rules on this page are easy to read.

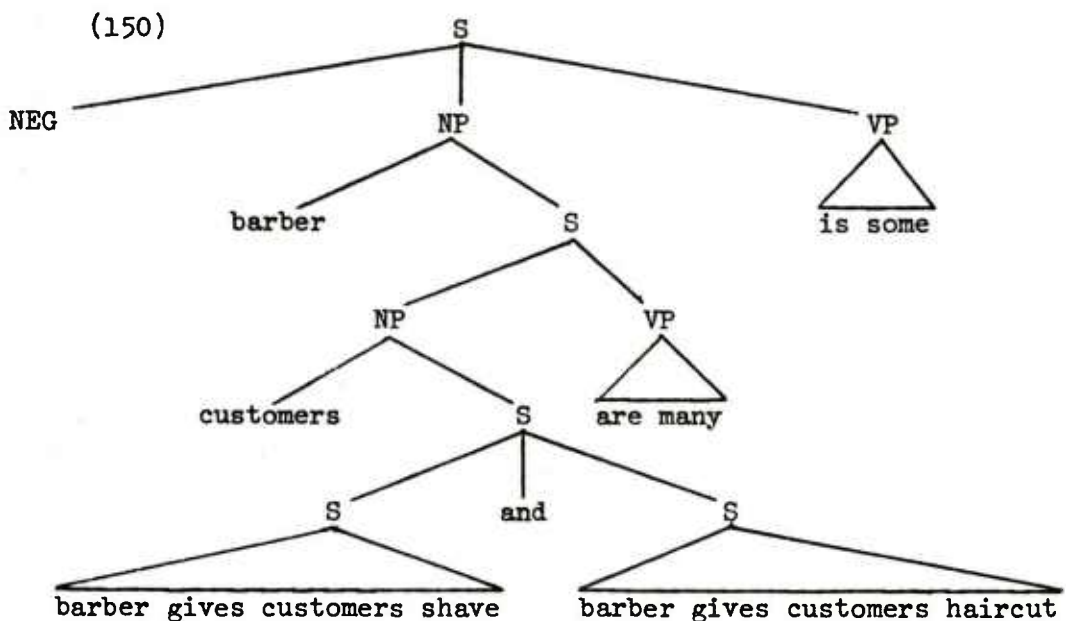
To provide the proper semantic interpretation, the deep structure of (147) would have to contain only as a predicate whose subject is explicit and easy to read; but easy to read cannot be a deep structure constituent. It thus appears particularly clear in this case that the semantic interpretation must depend in part on derived structure, where explicit and easy to read is indeed a single constituent in construction with only.

The possibility of deriving quantifiers from lower sentences was also used to account for the ambiguity of (129). But note that that ambiguity, at best tenuous, disappears if almost any other quantifier is substituted for many.

The arguments for deriving quantifiers from lower S's thus appear to be much weaker than those for deriving them from higher S's, given the Katz-Postal hypothesis. Further arguments for nesting of higher S's containing quantifiers appear when we turn to examples containing quantifiers and conjunction.

- (149) No barber gives many customers both a shave and a haircut.

To provide the correct semantic interpretation, both quantifiers must be outside the conjunction, as shown below:



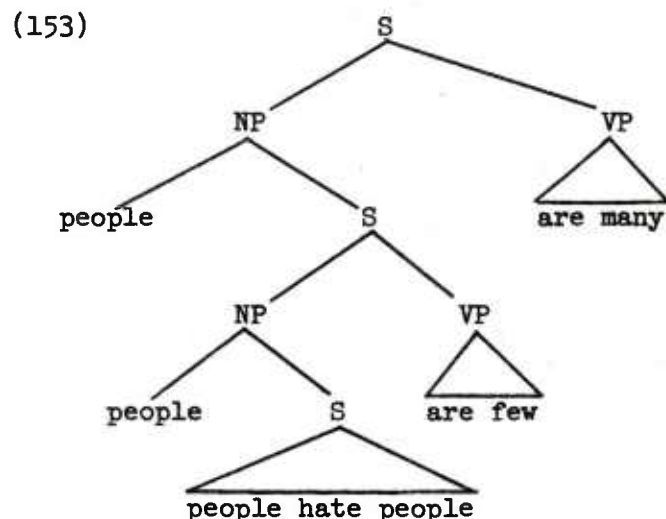
Since in this case the semantic interpretation can be captured only with quantifiers in stacked higher S's, not with one higher and one embedded, the argument for accounting for (134) in the same way is strengthened.

Structures like (150) and (135) have the quantifiers rather widely separated from the "kernel" occurrence of the noun phrase to be quantified; the matching of quantifier to noun relies on the identity of the nouns in matrix and constituent. But consider sentences like the following:

(151) Few people hate many people.

(152) Many people hate few people.

These sentences may or may not be ambiguous; in any case they have no readings in common. We will assume (as appears consistent with Lakoff, 1965) that if they are not ambiguous themselves, then their passives are interpreted with opposite order of quantifiers from that in the active. Then it would seem that both (151) and (152) (with their passives) have the same two possible deep structures:





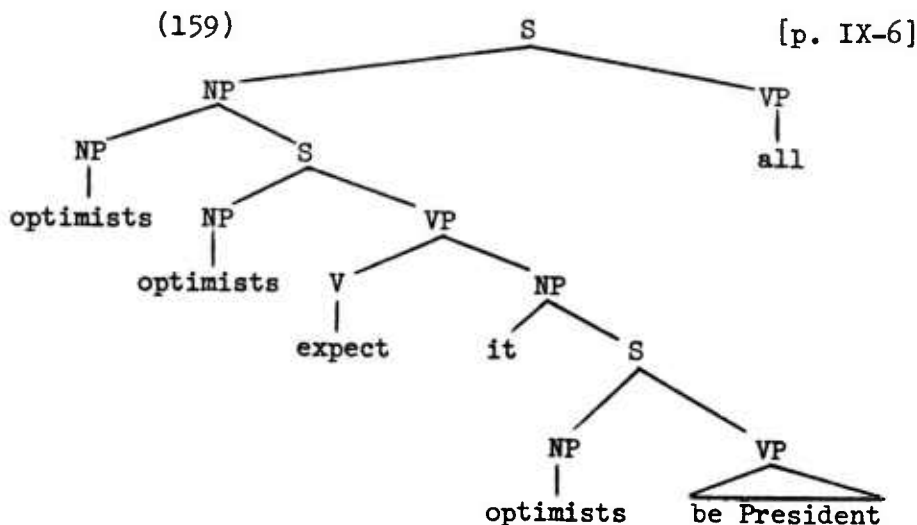
the Katz-Postal hypothesis that the semantic interpretation is determined solely by the deep structure is maintained, then sentences such as (142) and (143) must have syntactic deep structures essentially like (144) and (145). But we have shown above that any such proposal runs into extremely damaging counterarguments when its syntactic consequences are considered.

[This is the end of the excerpts from Partee (1968).]

Carden (1967b-1968)\* discusses two arguments for quantifiers as higher predicates. (The article was written earlier than Partee (1968) but came into our possession later.) His first argument concerns sentences like (158.a-b).

- (158) (a) All optimists expect to be President. [6.a]  
 (b) All optimists expect all optimists to be President. [6.b]

The traditional analysis of quantifiers and of equi-NP deletion derives the two sentences from the same source, but they are clearly not synonymous. Analyzing quantifiers as higher predicates would resolve the difficulty: equi-NP deletion could be ordered to precede the rule which incorporates the quantifier into the NP below it, so that equi-NP deletion would operate just on optimists in each sentence, yielding (158.a) from a tree like (159):




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\* The only version we have actually seen is the 1968 revision, which apparently takes cognizance of some criticisms of the 1967b original but offers the same analysis. Example numbers are from the 1968 version.



The tree for (158.b) would have an extra sentence with the second "all" in it; equi-NP deletion would not apply because at the point in the derivation when it might apply, the embedded NP would be all optimists and the higher one would just be optimists.

There are at least two problems with this argument, both acknowledged by Carden in his 1968 revision of 1967b, and neither necessarily insurmountable. The first is that for an appropriate semantic interpretation of (158.a), obviously a desideratum for this kind of analysis, there should be some representation that each optimist expects the Presidency for himself, not for "optimists" in general. The second problem is that the distinction between (158.a) and (158.b) is also found in sentences with no apparent quantifier, such as the following, pointed out by Jackendoff (1968a):

- (160) (a) Senators from New England expect to be treated with respect. [Jackendoff (1968a), 12]
- (b) Senators from New England expect Senators from New England to be treated with respect. [13]

Carden (1968) mentions similar sentences, attributed by him to Brian Sinclair.

Carden's second argument for quantifiers as higher predicates concerns NEG-raising (there called "Not-Transportation"). Sentence (161.a) is synonymous only with (161.b), never with (161.c), even though (161.d) is ambiguous in a way corresponding to (161.b-c).

- (161) (a) John doesn't expect all the boys to run. [Carden, 9.a]
- (b) John expects that not all the boys will run. [9.b]
- (c) John expects that none of the boys will run. [9.c]
- (d) All the boys don't run. [5]

His explanation of the data is that (161.d) can start out either with NEG higher than all or vice versa, but that Not-Transportation can take the NEG only from the highest embedded S, i.e. only from the structure corresponding to (161.b). Jackendoff (1968a) gives some arguments against Not-Transportation being a rule at all, which are reproduced and augmented in this report, cf. NEG. In

addition, there is at least one serious flaw in this argument of Carden's even within his own framework. The claim that NEG-raising can operate only from one S to the immediately dominating one is crucial to his argument, but there is much stronger evidence against such a claim than for it. Consider the following sentence:

- (162) (a) I don't believe he thinks she's coming until after dinner.  
 (b) The teacher doesn't expect three of the girls to pass the exam.  
 (c) The teacher doesn't expect us to answer 10 of the questions right.  
 (d) John doesn't expect any of the boys to arrive on time.  
 (e) John doesn't expect some of the boys to arrive on time.

If there is a rule of NEG-raising, it would have to be able to re-apply at successive levels to account for (162.a). Furthermore, for some dialects at least, (162.b) and (162.c) are each ambiguous in just the way that (161.a) is not; generating both readings would require allowing NEG-raising to operate over either one or two S's. And reinforcing the same counter claim, it appears that (162.d) and (162.e) are each unambiguous: but then for (162.e) NEG-raising would have to operate up two levels.

Carden's restriction may or may not be incompatible with (162.a); it is certainly incompatible with the dialects for which (162.b,c) are ambiguous, and it is totally incompatible with (162.e).

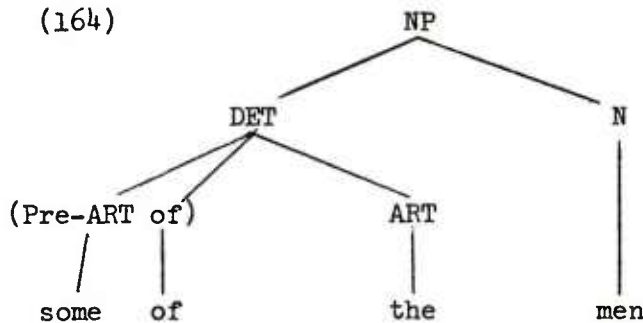
Hence we conclude that Carden has no good arguments for quantifiers as higher predicates. Cf. Lakoff's recent "Repartee" for what seem to be the strongest arguments so far for that analysis.

#### (b) Pre-Article vs. Post-Article Sources for Quantifiers

The choice between pre and/or post article sources for quantifiers hinges crucially on one's view of the source of constituents in phrases like those following.

- (163) (a) the three boys  
 (b) some of the boys  
 (c) each one of the boys  
 (d) each of the first three of the boys

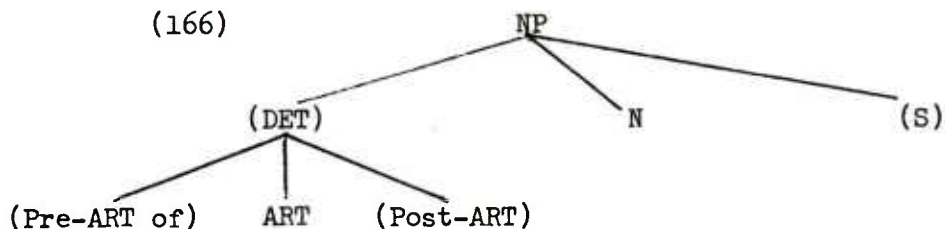
Those who have assumed that the surface structure reflects directly the deep structure have naturally proposed a quantifier source preceding the article. Thus, Hall (1962) and the MITRE grammarians (1965) proposed a pre-article quantifier something like the following.



This provides for phrases like those of (163.b). But in addition to its inability to generate (163.a) directly (except by calling three an adjective) and (163.c,d) by any means, its deficiencies (cf. Jackendoff, 1968b) include the following. (a) Of the men is not considered a constituent. Its prep-phrase qualities are not captured. (b) Number agreement is complicated since in some constructions agreement is with the head noun (165.a) while in others agreement is with either the pre-article or the head noun (165.b).

- (165) (a) All of the men shot themselves/\*himself in the foot.  
 (b) Each of the men shot ?themselves/himself in the foot.

In Hall (1963a) and Chomsky (1965) the following structure was proposed:

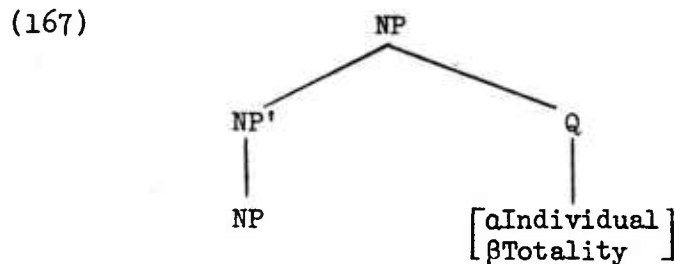


This accounts for both (163.a) and (163.b) directly. Furthermore it characterizes the fact that the pre-article quantifiers are a separate (but not disjoint) class from the post-article quantifiers. The former class include all, some, any, each, every, and either which cannot occur as post-articles.

Besides the obvious inability to account for phrases like (163.c) directly, Chomsky's analysis has the following drawbacks. Since some quantifiers occur in both positions (e.g., several, few, many, and the cardinal numbers), constructions such as three boys would be generated ambiguously even though they are semantically unambiguous. The recursive possibility of quantifiers (cf. (163.d)) has also been a difficulty for this and previous analyses.

The UESP grammar escapes these problems by employing a "partitive" analysis. (Cf. B.2)

Dougherty (1967a,b) proposed a post-NP source for a few quantifiers when dealing with conjunction. He assumed a NP structure as follows.



One innovation of his proposal is the use of features on the terminal symbol Q, the combination of which provides each, all, both, either, neither, and respectively. A second innovation is the employment of the features with constituents other than NP, i.e., S, VP, V. (In the present grammar the introduction of the above quantifiers on nodes other than NP is accomplished by transformational insertion in the conjunction process. Cf. CONJ.)

## 2. Partitives

The partitive analysis assumes that in the derivation of construction (168.a) there was a deletion of a noun after the quantifier. Thus (168.b) underlies (168.a).

- (168) (a) Two of the cooks  
 (b) Two cooks of the cooks

Some of the arguments in favor of a partitive analysis follow.

- (a) Non-restrictive relatives such as (169) require that the boys in the phrase many of the boys be analyzable as an NP, which is not possible if the determiner is many of the.

- (169) The boys, many of whom carried placards, marched a long way.

(b) Every one of the boys, each (one) of the boys, (n)either (one) of the boys, any (one) of the boys show traces of intermediate steps of the partitive derivation. The one is otherwise unexplainable. The variation in deletability of one after quantifiers has to be marked on independent grounds because of the "pronominal" use of quantifiers. Cf.

- (170) John brought out some stamps and Bill  
           examined  $\left\{ \begin{array}{l} \text{a few (*ones)} \\ \text{every one} \\ \text{each (one)} \end{array} \right\} .$

Apparently some quantifiers also reflect the prior presence of a noun (or pronoun) which merged with it. Viz.,

- (171) none of the books        \*none books  
        \*no of the books        no books

(c) Dean (1966, p. 22) points out that the posited N actually appears in some sentences in which forward pronominalization occurs. Cf.

- (172) Only four paintings of those which had been stolen were recovered. [60]

- (173) Only four         $\emptyset$         of the paintings which had been stolen were recovered. [57]

(d) Dean notes also that a slightly different construction lends further credence to the partitive analysis. Sentences like those in (174-5) parallel the partitive closely both syntactically and semantically.

- (174) Only one trout of the fish we caught was large enough to be worth cooking. [68]

- (175) Of the fish we caught only one trout was large enough to be worth cooking. [69]

The only significant difference this construction has seems to be the retention of the first N when it differs formally from the second. (Naturally there are strong selectional restrictions on the pairs and their order.)

(e) In (176) at least one of the relative clauses is associated with three.

(176) The three of the twenty boys who were in the room who wanted help screamed.

This can be represented quite simply within a framework which incorporates several NP's, but it is not clear how it would be handled if the three of the twenty were all one determiner in deep structure. See the tree (177) (next page), which represents roughly the deep structure for (176) in the UESP grammar.

(f) Number agreement between quantifiers and RRel's associated with them is automatically accounted for in the partitive analysis. Viz.,

(178) One of the boys who are in the room who want to get out is screaming.

(179) One of the boys who are in the room who wants...

(180) One of the boys who is in the room who wants...

(181) \*One of the boys who is in the room who want...

(g) Number agreement for singular one, each, every, (n)either of the boys is handled much more naturally since the head noun is singular.

(h) NRRel's provide evidence specifically for two occurrences of the head noun being present. Dean (1966) presents the ambiguous sentence (182).

(182) I bought a dozen of the eggs, two of which were cracked. [54]

On one reading, (a), two eggs of the dozen I bought were cracked; on the other reading, (b), two of the eggs were cracked and I bought a dozen of the eggs but I didn't necessarily buy any cracked ones. But as Dean points out, it is unambiguously two eggs that were cracked, so we may assume that the underlying structure had two eggs where (182) has just two. But then if it were claimed that dozen occurred by itself as an NP, we would expect (183) to be grammatical, since it differs from what would then be a stage underlying (182) only by the absence of the partitive phrase.



[illegible]

- (183) \*I bought a dozen, two eggs of which were cracked.  
[55]

Since (183) is ungrammatical, (182) should be analyzed as containing dozen eggs of the eggs at some earlier stage.

(i) The behaviour of negatives with quantifiers is more easily explained in the partitive analysis. If there were not an indefinite article preceding three in (184-5) as there is in the partitive analysis, then all the cardinal numbers in addition to the indefinite articles would have to be marked as [ $\pm$ SPEC], which would be both costly and counter-intuitive.

(184) Not three of the boys could answer the question.

(185) Three of the boys couldn't answer the question.

(j) In the partitive analysis, the plural indefinite article some (sm) can automatically occur in the environment ---- of the boys. Thus we do not have to postulate still another some, as would otherwise be necessary.

(k) The iterability of the quantifiers is accounted for, since with the analysis Quant N of NP, the last NP can itself be of the form Quant N of NP. E.g.,

(186) He ate some of each of the ten pies.

The strongest counterargument encountered so far is that provided by Postal's (1967) tests for definite/indefinite NP. According to Postal, many of the boys would appear to be definite; under our analysis the head NP and hence the entire NP is indefinite.

(187) There were many (\*of the) boys at the party.

(188) Big as  $\left\{ \begin{array}{l} \text{many of the} \\ *many \end{array} \right\}$  boys were, they couldn't lift it.

(189)  $\left\{ \begin{array}{l} \text{Many of the} \\ *Many \end{array} \right\}$  books are John's.

These counter examples seem considerably weaker than the arguments in favor, however. The construction in (188) is rather peripheral and has never to our knowledge been explored, and in (189) it is not clear how such a constraint would be stated in any case. In the case of (187), there are further examples which seem to indicate that QUANT OF DEF N is not always excluded from THERE-inversion:

(190) There were (a) few of his best friends on the list.

(191) There's a little of the coffee left.

(192) There were two of the Beethoven quartets on that program.

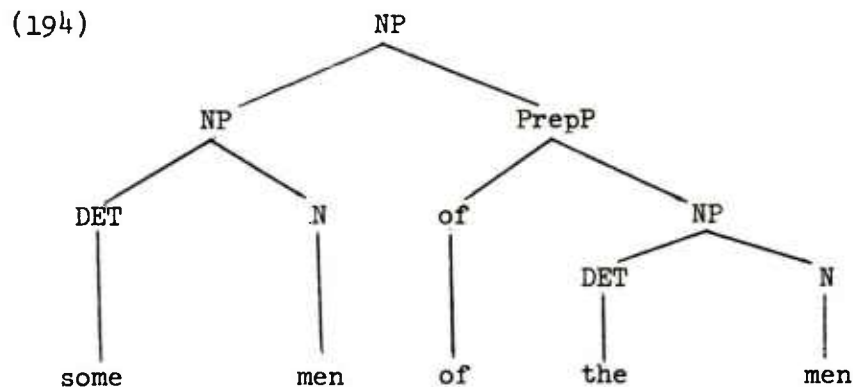
Even (187) with many of the boys does not sound so bad in the negative:

(193) The boys at that school are even livelier than the girls, but unfortunately there weren't many of the boys at the party.

In sum then, we would suggest that of the three counterarguments, one is in error and the other two depend on relatively unexplored phenomena and are thus much less compelling than the many independent arguments in favor of our analysis, all of which concern fundamental rules of the grammar.

Those writers who have championed the partitive analysis (e.g., Dean, 1966; Jackendoff, 1968b; UESP) have all proposed slightly different variants.

Dean proposes a structure such as (194):



She contends (correctly we believe) that full NP's are related in the partitive construction and that the second NP provides "a reference class, a delimitation of the 'universe' of which the referent of the first NP is a member". (p. 49) Hence the name "partitive". (We do not agree with her interpretation of the dominance relationships of the NP's. Cf. below.) Under this view, RRel's are possible on both NP's.

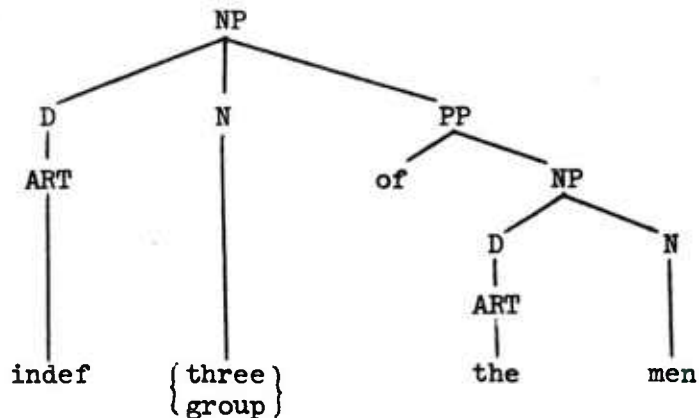
Dean also noted that when a RRel is present on the second N it is possible to pronominalize that N. Viz.,

(195) two cooks of those we hired last summer

She then explores the possibilities of having RRel's on each N and concludes that "whichever of the two N's deletes, the only relative clause which may delete is the one on the N of the preDeterminer" (i.e., the DET of the first N). She also contends (admittedly inconclusively) that the relative clause of the second N need not be present on the first N in the deep structure.

Jackendoff's (1968b) partitive proposal is similar to Dean's only in the use of a prep phrase for the of NP. He distinguishes three groups of items which precede of NP: (a) "classifiers"--a group, a herd, a gallon, a pound, etc.; (b) "pre-articles"--some, each, few, which, all, both, etc.; (c) "post-articles"--a few, many, one, three, etc. He then tries to derive the third in a manner parallel to the first. The result is a source such as (196).

(196)

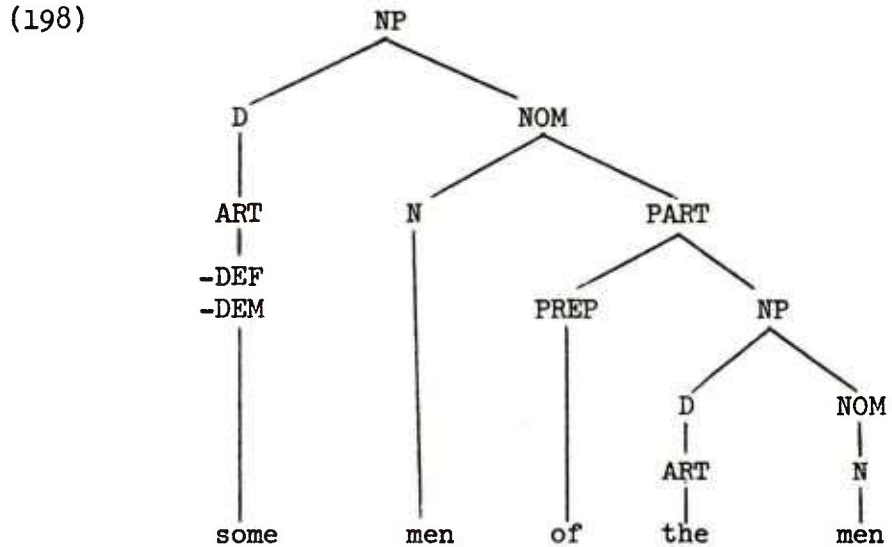


Because grave difficulties attendant to considering group (b) as nouns arise, Jackendoff treats them as articles with an "article-head combining" T, a theoretical innovation we are not prepared to accept on this single piece of evidence.

The UESP at one stage considered introducing the partitive construction in the NOM rewrite rule. PART could be chosen as a disjunctive option to the series of cases following N. Viz.,

(197) NOM  $\rightarrow$   $\left\{ \begin{array}{l} \text{NOM} \quad \text{S} \\ \text{N} \quad \left\{ \begin{array}{l} ((\text{Cases})) \\ ((\text{PART})) \end{array} \right\} \end{array} \right\}$

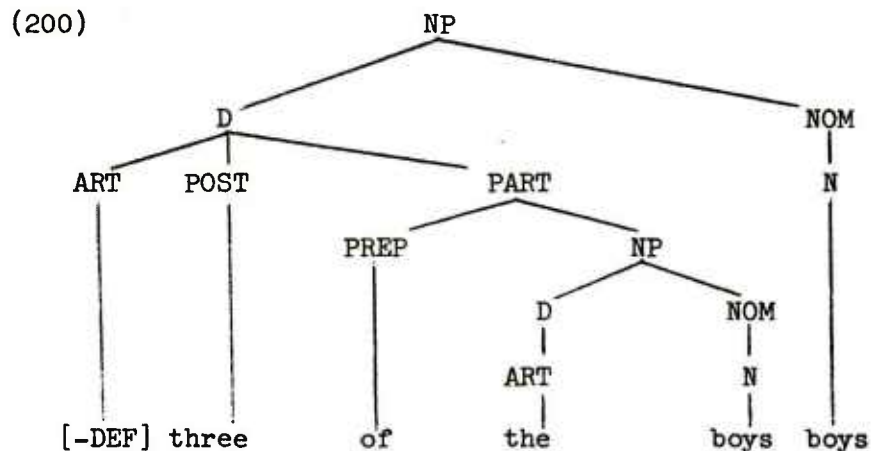
Like the cases, PART rewrites as PREP NP, where PREP is always of. This would allow a structure like (198) for some of the men.



Since the PART "case" would be restricted to noun phrases and excluded from sentences, and since furthermore even with nouns it shares virtually no relevant properties with other cases, such a position for the introduction of PART does not seem justified. The additional fact that some constituent of POST must almost always co-occur with PART has led us to adopt a D source for PART, namely by the rule

(199)  $D \rightarrow \text{ART (POST (PART))}$

which produces the structure



Further comments on this choice and on restrictions required by partitives are found below, III.B.3.

### III. THE ANALYSIS OF DETERMINERS

#### A. Introduction

The analysis of determiners involves primarily phrase structure rules and feature specifications and only secondarily transformations. The bulk of the discussion is centered around the two rules:

- (i) D  $\rightarrow$  ART (POST (PART))
- (ii) POST  $\rightarrow$  (ORD)(QUANT)(CHIEF)

Explicit feature specifications of deep structure and derived articles (corresponding respectively to first and second lexical look-up) are presented and argued for, including virtually all features that play a role in pronominalization. The use of Fillmore's (1966) feature [ $\pm$ SPECIFIC] in relating some and any is discussed at some length, along with the question of the number of distinct items some. It is argued that which and what should be represented as definite and indefinite respectively, not as specific and nonspecific indefinites. Generic articles are tentatively claimed to be definite.

The constituents POSTarticle and PARTitive are central to the treatment of quantifiers. The use of PART as a source for of-phrases with quantifiers is closely bound up with the absence of a PREarticle constituent. We claim that many of the boys is derived from many boys of the boys.

Among the constituents of POST, QUANTifiers are discussed in some detail, and subclasses with certain special properties are distinguished. ORDinals and CHIEF are only superficially described, and the relation of superlatives to POST, clearly an important one, only hinted at.

The short section on transformations includes the derivation of many of the boys, as well as certain idiosyncratic determiner transformations (e.g., deletion of of after all and both and the movement of certain quantifiers). This is followed by a section devoted to unsolved problems and unexplored areas.



Of the three analyses of relative clauses described in the REL section, viz. ART-S, NP-S, and NOM-S, it is the NOM-S analysis that has been assumed elsewhere in the grammar. Under that analysis it is crucial that the main break in the NP be between the Determiner and the rest, i.e. NOM. (Relative clauses then come from the expansion  $NOM \rightarrow NOM\ S$ .) Identity for relativization is then claimed to be between NOM's; the embedded determiner is required to be a [+SPEC, -DEF] ART, while the matrix determiner is unconstrained. This choice of embedded determiner eliminates certain ungrammatical relative clauses by independently needed constraints on determiners, e.g.

(201) ?The boys of whom three were sick played better than the boys who were healthy.

(This seems to be just about exactly as odd as the sentence which would have to underly its relative clause, ?three of some boys were sick.)

(202) \*The judge that my cousin is is honest. (The article in My cousin is a judge is not [+SPEC].)

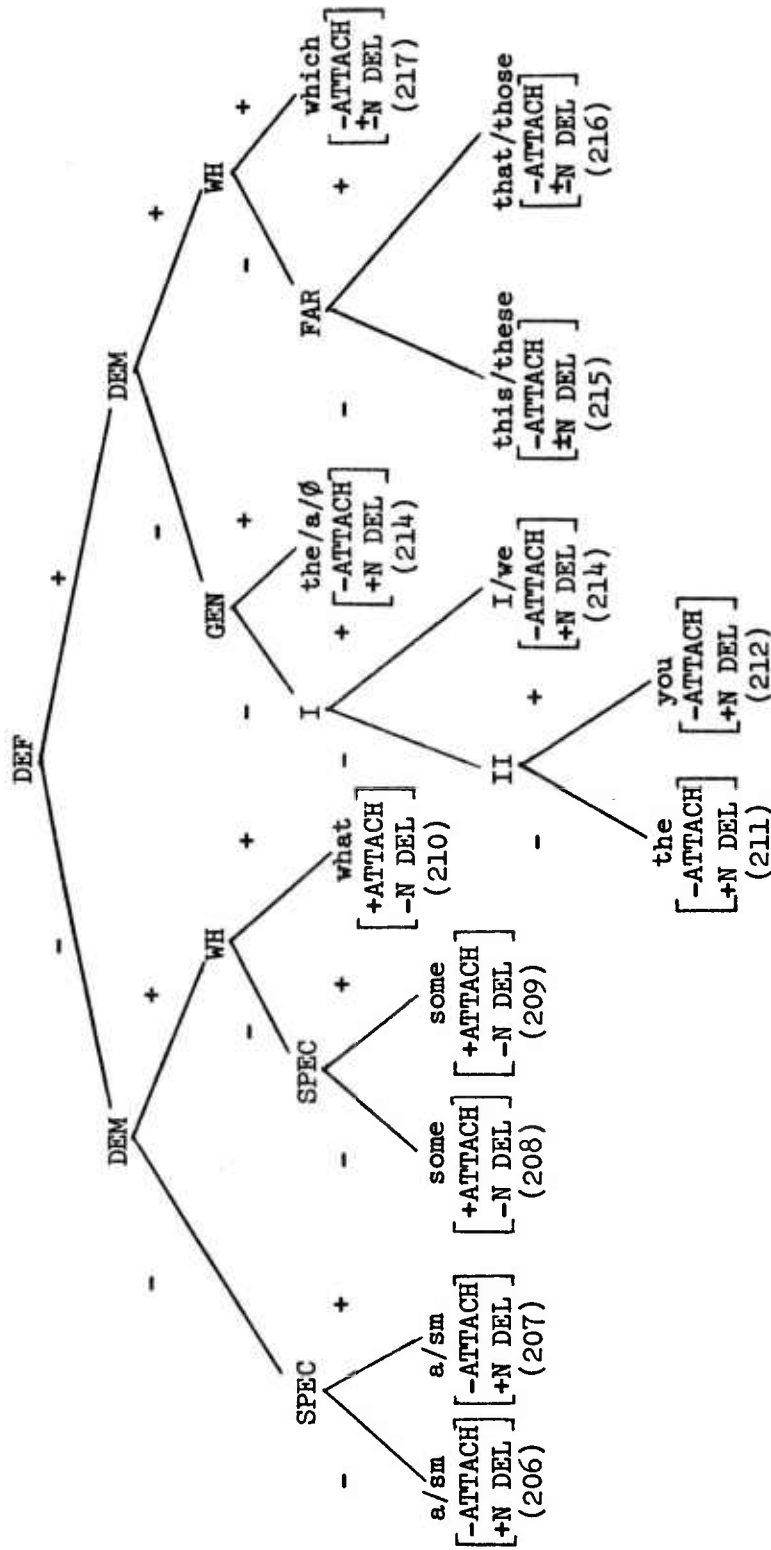
## B. PS Rules and Feature Specifications

### 1. $D \rightarrow ART\ (POST\ (PART))$

POST, PART, and the absence of PRE are discussed under the expansion of POST.

ART is being treated as a terminal node to which various lexical items with distinct feature specifications are attached. Since transformations cause considerable changes in the feature composition of these items (see, e.g. REL, PRO, NEG), a separate second lexical look-up will be required at the surface level. It is assumed that no phonological matrices will be inserted for these items until the second lexical lookup.

The following tree represents the possible articles inserted in the base. The spelled out forms are typical surface realizations of these deep structure feature complexes, but are not exhaustive. Further discussion of the features and of the various articles follows the tree. Numbers on the articles refer ahead to subsection (c).



(203) Deep Structure Articles

## (a) Redundancy Rules

A quick glance at (203) reveals the possibility of stating several features and their specifications by redundancy rules in the lexicon. We list those rules here and note their two functions: (a) the rules in (204) fill in the values of the rule features

predictable, and (b) the rules in (205) specify the values for all the nondistinctive features.

(204) (a) [+DEF] → [-ATTACH]

(b) [-DEM] →  $\begin{bmatrix} -\text{ATTACH} \\ +\text{N DEL} \end{bmatrix}$

(c)  $\begin{bmatrix} -\text{DEF} \\ +\text{DEM} \end{bmatrix}$  →  $\begin{bmatrix} +\text{ATTACH} \\ -\text{N DEL} \end{bmatrix}$

(205) (a) [-DEF] → [-GEN]

(b) [+DEM] → [-GEN]

(c) [-DEM] → [-WH]

(d) [ ] →  $\begin{bmatrix} -\text{PRO} \\ -\text{INDET} \\ -\text{NEG} \end{bmatrix}$

The last rule above, (205.d), marks all deep structure articles as [-PRO], [-INDET], [-NEG]. The corresponding positive values are introduced by T-rules: [+PRO] by Noun-node Deletion (cf. PRO); [+INDET] by SOME-ANY Suppletion and SOME-ANY REL Suppletion (cf. NEG); and [+NEG] by ANY-NO Suppletion (cf. NEG). The features [ $\pm$ COUNT], [ $\pm$ HUMAN], [ $\pm$ MASC], and [ $\pm$ PLURAL] are also added transformationally, by an agreement rule, Transfer of Noun Features to Article (cf. PRO). Since that rule assigns the feature with its noun value to the article, and since the rule applies to all articles, those features can be omitted entirely from the underlying representation for articles.

## (b) Explanation of Features

The non-self-explanatory features are used in the following ways.

[ $\pm$ SPEC(ific)] is used in the sense of Fillmore (1966d); it distinguishes the some's which become any from those that do not (see NEG and II.A.5 above).. The ambiguity of I need some books is attributed to this feature.

[ $\pm$ FAR] is simply the name arbitrarily given to the feature distinguishing this/that, here/there, now/then.

[ $\pm$ ATTACH] is a rule feature (see PRO for Article Attachment transformation). The feature [ $\pm$ ATTACH] is assigned to the combining forms every-, any-, some-, and -one, -thing, -body, -place, -time, and -times in the deep structure, and transformationally to article and noun stems which have the feature [ $\pm$ REFL(exive)]. The difference between everyone and every one is taken to reside in the noun, not in the determiner.

[ $\pm$ N(oun) DEL(ete)] is also a rule feature, used in the rule which erases one(s) after cardinal numbers, superlatives, many, few, several, etc., a/sm (which are then realized as one/some), the (then realized as he, it, etc.) and certain other determiners. Where it is optional, e.g. which(one), (n)either(one), each(one), etc., the value of the feature is chosen before insertion into the deep structure.

This feature presents a problem with this/that. Perhaps it should always be Minus with this/that as Fillmore's (1966d) analysis would suggest, and certainly in most dialects in the plural. (See PRO.)

The personal pronouns are assumed to be fundamentally articles, as in Fillmore's (1966d) modification of Postal's (1967) analysis. The person features must originate on the article to generate we Americans, etc.; although number, gender, etc., are derived by agreement with the noun, as mentioned above.

No strict subcategorization features have been listed, although a more complete grammar would have to include some. For instance, certain determiners cannot occur after be, i.e. in the ESSIVE case (cf. III.D.9). Most articles cannot precede S, and there are restrictions on the non-third person definite articles. Only the definite article can occur in PART (although there seems to be divergence of opinion on this point).

There are two restrictions commonly suggested that we reject even in principle, however. Many older transformational grammars analyze personal pronouns as nouns and require no article or only the definite article with them; such restrictions are obviated by Postal's analysis (and there are no special restrictions with our Pro-N one.) Similarly, proper names have been claimed variously to occur with no article or only with a definite article; but we agree with Sloat (1968) that there are no such restrictions, but only a late T-rule deleting the before a proper name if there is no following relative clause.

(c) Surface Structure Articles

The surface structure items which evolve from the underlying features, and some brief notes on their derivations, are listed next. A fuller discussion follows in the next section.

- (206) a/sm all the items below have the features: [-DEF, -DEM, -SPEC, -GEN, -ATTACH, +N DEL, -WH, -I, -II, +III]

- |                   |                                 |   |
|-------------------|---------------------------------|---|
| (a) <u>a</u> :    | [-PL, +COUNT, -PRO, -INDET]     | } number agreement only   |
| (b) <u>sm</u> :   | [{-COUNT}, -PRO, -INDET]<br>+PL |   |
| (c) <u>one</u> :  | [-PL, +COUNT, +PRO, -INDET]     | } the feature [+PRO] is<br>acquired when the noun<br>is deleted (see PRO) |
| (d) <u>some</u> : | [{-COUNT}, +PRO, -INDET]<br>+PL |   |

Forms (c) and (d) also occur when the article receives stress by some process other than deletion of the noun, although we have not formulated the rules for this. For some of the relevant environments, cf. Perlmutter (1968); his analysis is quite different, as discussed above in II.A.2, but we agree at least on the fact of a/one suppletion in a number of environments.

- (e) any: [±PL, ±COUNT, ±PRO, +INDET, -NEG]

[+INDET] is acquired by the some-any suppletion rule: see NEG.

- (f) no: [±PL, ±COUNT, -PRO, +INDET, +NEG]: see NEG.

- (g) none: [ $\pm$ PL, $\pm$ COUNT,+PRO,+INDET,+NEG]: this form occurs when the following noun is deleted-- see PRO.
- (207) a/sm: [-DEF,-DEM,+SPEC,-GEN,-ATTACH,+N DEL,-WH,-I,-II,+III]
- (a) a, sm, one, some as above, but not any/no/none.
- (208) some: all the items below have the features: [-DEF,+DEM,-SPEC,-GEN,+ATTACH,-N DEL,-WH,-I,-II,+III]
- (a) some: [ $\pm$ PL, $\pm$ COUNT,-PRO,-INDET] in some boy(s), something
- (b) any: [ $\pm$ PL, $\pm$ COUNT,-PRO,+INDET,-NEG] in any boy(s).  
anything
- (c) no: [ $\pm$ PL, $\pm$ COUNT,-PRO,+INDET,+NEG] in no boy(s), nothing
- (209) some: [-DEF,+DEM,+SPEC,-GEN,+ATTACH,-N DEL,-WH,-I,-II,+III, $\pm$ PL, $\pm$ COUNT,-PRO] no alternants
- (210) what: [-DEF,+DEM,-GEN,+ATTACH,-N DEL,+WH,-I,-II,+III, $\pm$ PL, $\pm$ COUNT,-PRO]
- What attaches to -thing to give what, to -one to give who, to -place to give where, etc.
- (211) All items below have the features:  
the: [+DEF,-DEM,+N DEL,-I,-II,+III,-WH]
- (a) the: [-PRO, $\pm$ PL, $\pm$ COUNT,-ATTACH]
- (b) he: [+PRO,-PL,+COUNT,-ATTACH,+HUM,+MASC]
- (c) she: [+PRO,-PL,+COUNT,-ATTACH,+HUM,-MASC]
- (d) it: [+PRO,-PL, $\pm$ COUNT,-ATTACH,-HUM,+[\_NP [\_\_\_\_]]]
- (e) that: [+PRO,-PL,-COUNT,-ATTACH,-HUM,-[\_NP [\_\_\_\_]]]



(f) they: [+PRO,+PL,-ATTACH,+<sub>NP</sub>[\_\_\_\_]]

(g) those: [+PRO,+PL,-ATTACH,-<sub>NP</sub>[\_\_\_\_]]

Number, [ $\pm$ HUM], [ $\pm$ MASC] are assigned by feature transfer from the head noun, as is Case, which is not included here (see PRO). [+PRO] is assigned when a following one(s) is deleted.

The feature +<sub>NP</sub>[\_\_\_\_] is assigned when N DEletion leaves no items in the NP other than the ART; it accounts for the use of that/those as non-demonstrative pronouns, used when a relative clause follows, in suppletion with it/they in the absence of a relative (see PRO).

The first half of reflexives come from the same source; their variant shapes are triggered by the additional feature [+REFL], and the fact that reflexives are one word is indicated by the transformationally added feature [+ATTACH] (all other derivatives of the are [-ATTACH]).

(h) him: [+PRO,+REFL,-PL,+ATTACH,+HUM,+MASC] etc. (see PRO)

(212) you singular and plural and its various forms are analogous to he, etc., above; the features are spelled out explicitly in the PRO report.

(213) I, we are similar; see PRO.

(214) the/a/Ø (generic)--whether GEN has underlying items is unknown.

We have not established the conditions for differentiating these surface variants of the [-PRO] generic article, except of course that a is [-PL,+COUNT] and Ø is [+PL] or [-COUNT]. The [+PRO] forms are exactly the same as those for the (211) (e.g. They say porridge is good for you but I can't stand it, [Wolfe 45] i.e. "porridge".)

(215) this: [+DEF,-GEN,+DEM,-FAR,±N DEL,±PRO,-ATTACH,-WH,  
-I,-II,+III]

(a) this: [....,-PL,±COUNT]

(b) these: [.....,+PL,+COUNT]

(216)

(a) that: [....,+FAR,....,-PL,±COUNT]

(b) those: [....,+FAR,....,+PL,+COUNT]

These and those are not allowed to be [-N DEL] in  
those dialects which exclude these ones, those ones.

(217) which: [+DEF,-GEN,+DEM,+WH,-ATTACH,±N DEL,±PL,±COUNT,  
±PRO,-I,-II,+III,±HUM]

no alternants.

#### (d) Justification of ART Analysis

(i) Justification and further description of this treatment of pronouns and of the features [N DEL] and [ATTACH] will be found in PRO.

(ii) The problems in analyzing generic articles are discussed above in Section II.A.4. From among the proposals considered there, we have incorporated Postal's (1967) suggestion that [+GEN] is a subclass of [+DEF], but this obviously leaves uncaptured a number of significant semantic and syntactic facts.

(iii) The which/what dichotomy for interrogative determiners is here regarded as one of [±DEF], following Katz and Postal (1964b) and Fillmore (1966d). However, since [-DEF] articles are subclassified as [±SPEC], that dichotomy might conceivably be a more appropriate basis for distinguishing which/what, particularly since the relative determiner-pronoun which is derived from a [-DEF,+SPEC] article, not from a [+DEF] one; the issue is complicated by the possibility of definitization in the relative clause.

In addition to the greater symmetry among the deep structure articles provided by maintaining that which is [+DEF], there is also a strong argument in favor of that analysis from the feature [ $\pm$ ATTACH]. (This is essentially Katz and Postal's argument.) The indefinite articles (in particular, the demonstratives as we argue later), both [ $\pm$ SPEC], occur in one-word compounds, someone, something, anyone, etc., while the definite demonstratives do not: \*thisone, \*thatthing, etc. The substantives what and who parallel someone and something as one-word forms, whereas there are no comparable combined forms for which.

However, it may be suggested that who is in fact ambiguous as to which/what, and that which as a substantive may derive from \*whichthing as well as from which one(s). The possibility that where and when are ambiguous in this way seems even more likely. There seems to be a divergence of intuitions on this point, and we have not found any airtight arguments either way. We have provisionally accepted the [+DEF] analysis of which rather than the [-DEF,+SPEC] analysis.

(iv) Some and any

a. Following Fillmore (1966d) the some-any suppletion rule is made to depend on the feature [ $\pm$ SPEC(ific)] and is obligatory, rather than optional as in Klima (1964c). (See NEG.)

b. Two some's are distinguished. One is the non-demonstrative plural/mass indefinite article (i.e. the plural/mass form of a), which is pronounced with a reduced vowel (sm) when it is [-PRO] (i.e. when its head noun is not deleted) and has not received any contrastive stress. When it is [+PRO], or when it has received contrastive stress, it has the full-vowel pronunciation some; in corresponding environments a becomes one.

(218) He has { a book  
sm books } and I have { a book  
sm books } too.

(219) He has { a book  
sm books } and I have { one  
some } too.

(See PRO for the rules which accomplish this.)

The other some is distinguished by the fact that it can occur with singular count nouns.

(220) Some boy called while you were gone.

Note that the stress pattern is 2-1; the same stress pattern can be found with plurals:

- (221) Some idiots were giving out guns to anyone who came by.

Hence we conclude that the some which can occur with singular count nouns can also occur in the plural.

The feature specification of this second some is not obvious; we have called it an indefinite demonstrative, following a suggestion of Chomsky's (in a class at M.I.T.; he further suggested that some/certain was parallel to this/that, which we do not find plausible). We have no compelling arguments; the resulting symmetry of the article system compares favorably with an ad hoc feature coupled with an accidental gap, which would result if some other feature than [DEM] were used.

- c. The some of some of the  $\left\{ \begin{smallmatrix} \text{boys} \\ \text{butter} \end{smallmatrix} \right\}$  is not a third some; it is simply the [-DEF,-DEM] article (a/sm) in its [+PRO] form, derived from some  $\left\{ \begin{smallmatrix} \text{boys} \\ \text{butter} \end{smallmatrix} \right\}$  of the  $\left\{ \begin{smallmatrix} \text{boys} \\ \text{butter} \end{smallmatrix} \right\}$ .

See justification of the POST expansion rule (section III.B.2.d, below).

- d. The combining form some- of someone, something, etc., can be seen to be the [-DEF,+DEM] article, since -one, -body, -thing, are singular. Further evidence is cooccurrence with -or other:

- (222) Some boy or other called.

- (223) I saw somebody or other fooling with the lock.

- e. Both some's and some occurrences of the singular a undergo any-suppletion (see NEG section) and hence can be [-SPEC].

- (i) a  $\Rightarrow$  any:

- (224) This house doesn't have any roof.  
(\*.....has some roof)

However, not all [-SPEC] a's can be replaced by any.

- (225) \*I don't have any cigarette.

It would appear that a  $\Rightarrow$  any can take place after the have which indicates part/whole relations but not after possessional have.

(ii) sm  $\Rightarrow$  any

(226) I bought sm books today/I didn't buy any books today.

(227) John bought some, but Bill didn't buy any.

(227) exemplifies the [+PRO] form of a/sm; note that the demonstrative some does not have a [+PRO] form, as evidenced by the fact that the substantive some can never be understood as having a deleted singular count noun.)

(iii) Demonstrative some  $\Rightarrow$  any

(228) I didn't see anybody there.

Example (228) is weak evidence, in that it depends on the decision to analyze the combining form some- as the demonstrative. Examples parallel to (222) are harder to find. Perhaps the following is such a case.

(229) I don't believe any boy called.

Sentence (229) is certainly not a case of sm  $\Rightarrow$  any, since sm does not occur with singular count nouns. It differs from (222), however, in not allowing or other to be added. It could conceivably be a case of a  $\Rightarrow$  any.

f. That both some's can be [+SPEC] as well as [-SPEC] can be seen from the following:

(230) Some of the boys didn't go.

(231) Some boy didn't wipe his feet off.

(232) Someone isn't telling the truth.

g. The two some's can both occur with a following plural or mass noun. They are differentiated by stress pattern.

(233) sm    boys    [-DEM]  
          4        1

(234) some boys    [-DEM], with contrastive stress added,  
          1        3    contrasting with others or all/none.

(235) some boys      (-or other)    [+DEM]  
                  2           1

h. Any is generated as a suppletive alternant of both [-SPEC] some's and a in the environment of NEG, WH, and [+AFFECT] -words (see NEG). The "generic" any of

(236) Any student can run for office.

is not generated by those rules. This any occurs in the same environments as either and shares a number of properties with every, each and all. It is therefore being classed with them as a [+DIST(ributive)] QUANT(ifier), rather than as an article. (It is conceivable that all of the [±DIST] QUANT's (see next section) are actually articles; treating them as such would appear to be compatible with the rest of our analysis, and would eliminate the need for special co-occurrence restrictions between these quantifiers and articles.)

## 2. POST → (ORD)(QUANT)(CHIEF)

ORD(inal) includes first, second, ..., last, next, perhaps only, and perhaps (presumably derivatively) superlatives. See note under Unexplored Areas and Unresolved Problems on complements with ORD.

QUANT(ifier) includes one, two, ..., several, many, a few, which have the feature [-DIST(ributive)], and all, each, every, either, any, which are [+DIST(ributive)]. See section on DISTributives below.

Only any and every occur in compounds with -one, -body, -thing, etc., and thus have the feature [+ATTACH]. All of the QUANT's except every have the feature [+N DEL], permitting them to stand as pronouns. This feature is optional for each and either, since they can occur with or without a following one.

CHIEF includes main, chief, principal, upper, inner, lower, outer, and perhaps poor in the sense of poor John and old in the sense of an old friend. This category has not begun to be explored here; Bolinger (1967) has some relevant comments. At the moment this is just a repository for adjectives which appear not to be derivable from reduced clauses.

### (a) Order of POST Constituents

Among the constituents of POST, QUANT appears to follow ORD(inal) and precede CHIEF.



Examples having all three constituents follow.

- (237) (a) The last three poor men who tried that were eaten alive.
- (b) The next few principal speakers will be briefer.
- (c) The first three inner doors have combination locks.
- (d) \*The first every main idea...
- (e) \*The last all outer doors...

(The [+DIST] QUANTifiers appear to be excluded from occurring following ORDinals or following the definite article, so (d) and (e) should be ruled out on two counts; but see section (b) below for an alternative explanation.)

There are apparent exceptions to this order however.

- (238) All first children are spoiled. (Q-0)

This appears to be an adjective first (=firstborn) rather than a true ORDinal. Since ordinary adjectives follow CHIEF, this would then be the expected order.

- (239) Every second child was given a pencil. (Q-0)

This is ambiguous; on one reading second is an adjective (as in every second son is neglected), and hence not exceptional. On the other reading, where second = other (but third, etc., also occur) this does seem to be a real exception not accounted for.

- (240) All three boys hurried out. (Q-Q)

See the transformational rules, where this is derived from all of the three boys, hence not exceptional.

- (241) Every three days he calls his broker. (Q-Q)

This is a frequency adverbial, not an ordinary NP. Note the absence of \*Every three children were sick.

- (242) Three more people arrived yesterday. (Q-Q)

All determiners containing more, most, less, least, or comparatives such as fewer, etc., involve adverbs of degree modifying a quantifier, not two quantifiers. Details are not worked out here, however.

(b) Distributives

In most discussions of quantifier analyses and partitives, the plural cardinal numbers, e.g. three, have been taken as typical. Many items commonly regarded as quantifiers behave differently from the cardinal numbers in significant respects, however. Some of these differences are great enough to call into question the inclusion of all of these items under a single category QUANT. Note that we have included all instances of some under ART, not QUANT; this would suggest that some other quantifiers may be ART's, particularly those which cannot occur with (other) overt articles.

In earlier analyses which distinguished PRE- and POST-articles, both classes included quantifiers; the quantifiers in POST (which we refer to as DISTributive) were a subset of those in PRE, based on differences such as the following.

- (243) (a)  $\left\{ \begin{array}{l} \text{Three} \\ \text{Many} \\ \text{Few} \\ \text{Several} \end{array} \right\}$  of the boys were sick. (PRE)

- (b) The  $\left\{ \begin{array}{l} \text{three} \\ \text{many} \\ \text{few} \\ \text{several} \end{array} \right\}$  boys were sick. (POST)

- (c)  $\left\{ \begin{array}{l} \text{Three} \\ \text{Many} \\ \text{Few} \\ \text{Several} \end{array} \right\}$  boys were sick. (ambiguously generated as PRE or POST with [-DEF] article, though in fact apparently unambiguous.)

(d)  $\left\{ \begin{array}{l} \text{Every one} \\ \text{Any (one)} \\ \text{Either (one)} \\ \text{Each} \\ \text{Some} \\ \text{None} \\ \text{All} \\ \text{Both} \end{array} \right\}$  of the boys may have done it.  
(PRE)

(e) \*The  $\left\{ \begin{array}{l} \text{every (one)} \\ \text{any} \\ \text{either} \\ \text{each} \\ \text{some} \\ \text{no} \\ \text{all} \\ \text{both} \end{array} \right\}$  boy(s) may have done it.  
(non-POST)

(f)  $\left\{ \begin{array}{l} \text{Every} \\ \text{Any} \\ \text{Either} \\ \text{Each} \\ \text{Some} \\ \text{No} \\ \text{All} \\ \text{Both} \end{array} \right\}$  boy(s) may be investigated. (PRE with  
[-DEF] ART)

Within the partitive analysis, another basis for the distinction must obviously be found. There are basically two choices: either both types are QUANT, differing only in certain syntactic features, or the Distributives are of another category, with a likely candidate being ART.

Among the relevant considerations are the following:

(i) Some has been argued to be an article; in fact two distinct articles some have been defended. There seems to be no good defense for introducing a third some as a QUANT, but it certainly shares many properties with the Distributives. For instance, all of the forms which can combine with -one, -body, -thing, etc. are Distributives: every-, any- (both suppletive and "generic"), no- (suppletive form). Although this is a relatively superficial fact, it would be more reasonable for the feature [+ATTACH] marking such forms to be restricted to a single category.

(ii) The non-occurrence of (243.c) would be automatically accounted for if Distributives were articles; it requires otherwise an ad-hoc contextual feature limiting their occurrence to the environment of some one specific article, which is subsequently deleted. Arguments for the choice of article are not obvious; semantically (except for both, which always seems to be definite, and in the same way as all three--it is probably best regarded as derivative from all two, and therefore need not be treated as a Distributive at all) they seem distinct from ordinary cases of either definite or indefinite, and share many properties of generics. They all fail Postal's environmental tests for definiteness, but except for [-DEM] cases of some (and its suppletive any and no), they cannot occur in existential There is/are... sentences either.

(iii) It is the Distributives which cause serious problems in the formulation of identity conditions for pronominalization and EQUI-NP deletion (see PRO and NOM) as well as for the postulation of plausible constituent determiners for relativization (see REL). They are also the ones which seem least plausible as predicates in a Lakoff-type analysis. The fact that similar problems arise with  $\emptyset$ -article generics lends plausibility to the notion that the Distributives might be generic articles, but might simply mean that the deleted co-occurring article was generic.

- (244) (a) All philosophers respect themselves.  
 (b) Every boy helped himself.  
 (c) Masochists hate themselves.  
 (d) All philosophers respect all philosophers.  
 (e) Every boy helped every boy.  
 (f) Masochists hate masochists.  
 (g) (All) women expect (all) women to talk  
       about babies at parties.  
 (h) (All) women expect to talk about babies  
       at parties.  
 (i) { No } linguist who understands Chomsky  
       { Every } believes him.  
 (j) Linguists who understand Chomsky believe him.

Further, presumably related, problems arise in the imperatives, where the combined forms somebody, everybody, nobody seem to be able to function as second person. Other quantifiers share the same

behavior to some extent, but in such cases seem more like vocatives, which nobody certainly cannot be. (Cf. IMP.)

- (245) (a) Nobody say a word (please).  
 (b) Everybody cross yourself when you go up the aisle (Please).  
 (c) ?Five boys go to the blackboard now (please).  
 (d) \*Many boys go to the blackboard now (please).  
 (e) The few boys in the back row move up closer (please). (vocative?)

(iv) If the Distributives co-occur with the other quantifiers, their analysis as articles is further motivated. If they cannot, then the question is one of relative complexity of constraints, since the Distributive class must in any case be excluded from the environment of most articles. The facts are not altogether clear. Some combinations seem acceptable, others marginal or totally excluded. Further complications arise from the fact that some of the acceptable ones seem to have very special interpretations, and some of the unacceptability judgments may be due to semantic incompatibility.

- (246) (a) Any three boys can solve that problem.  
           (ambiguously together vs separately)  
 (b) Some few people listened to the closing speech.  
 (c) No two snowflakes are exactly alike.  
 (d) ?Every ten students { have } a separate squad.  
   { form? }  
 (e) \*Each three students have a separate room.  
 (f) \*Either five carpenters could have built that house.  
   [But every, each, either require singular nouns anyway]  
 (g) { \*Some }  
       { \*Any } many students came to the meeting.  
       { \*No }  
 (h) All { three } babies started crying at once.  
           { several }

Note that the treatment of some as an article accounts for all the clearly acceptable cases, namely (246.a-c), but also generates the unacceptable (246.g).

None of the arguments given above appears conclusive with respect to the basis for distinguishing the Distributives from the other quantifiers, and although the choice would have repercussions in several other areas of the grammar, part of the problem is that

no analysis has been found which will solve the problems raised by these quantifiers in those areas. Thus we have still an unsolved problem at this point which correlates with unsolved problems for EQUI-NP deletion, relativization, pronominalization, and imperatives. This is clearly a crucial area for further investigation.

In UESP 1967 the Distributives were analyzed as QUANT's having an ad hoc feature [+DIST]. We now regard the ART analysis as slightly more defensible, but not sufficiently so to carry out the revisions required, since either analysis would be extremely tentative.

(c) Lexical entries for QUANTifiers

1. many/much/few/little: [-DIST,-ATTACH,+N DEL]  
(unmarked for [\_\_[-COUNT]], [\_\_[+PL]], [[+DEF]\_\_],  
[[-DEF]\_\_].)
2. two, three,...: [-DIST,-ATTACH,+N DEL,+[\_\_[+PL]],  
-[\_\_[-COUNT]]]
3. one: [-DIST,-[\_\_[-COUNT]],-[\_\_[+PL]],-ATTACH,+N DEL]
4. several: [-DIST,-ATTACH,+N DEL,-[\_\_[-COUNT]],+[\_\_[+PL]],  
-[[[-SPEC]\_\_]]]
5. a few/a little: [-DIST,-ATTACH,+N DEL]
6. every: [+DIST,-[\_\_[-COUNT]],-[\_\_[+PL]],-[[+DEF]\_\_],  
-[[+SPEC]\_\_],+ATTACH,-N DEL]
7. any: [+DIST,+ATTACH,+N DEL,-[[+DEF]\_\_],-[[+SPEC]\_\_]]
8. either: [+DIST,-ATTACH,-[\_\_[-COUNT]],-[\_\_[+PL]],  
-[[+DEF]\_\_],-[[+SPEC]\_\_]]
9. each: [+DIST,-ATTACH,-[\_\_[-COUNT]],-[\_\_[+PL]],-[[+DEF]\_\_],  
-[[[-SPEC]\_\_]]]
10. all: [+(<sup>1</sup>?)DIST,+N DEL,-ATTACH,-[[+DEF]\_\_],-[[+SPEC]\_\_]]

The numeral one which appears as a quantifier is distinguished in our analysis both from the pro-N one and from the one which occurs as a stressed variant of a. Discussion can be found above, II.A.2,



and in PRO, II.B.2. The following examples have similar surface structures but different deep structures for one:

- (247) (a) John has two cars but Mary has only one. (QUANT)  
 (b) John has a car and Mary has one too. (ART)  
 (c) John has a blue car and Mary has a red one.  
 (N[+PRO])

### 3. PARTitives

All 'prearticles' are here analyzed as POST articles, and more specifically as QUANT's. The [-DIST(ributive)] QUANT's can occur with either a definite or an indefinite article:

- (248) (a) [+DEF] The three boys are here.  
 (b) [-DEF] Three boys are here.

The [+DIST] QUANT's can occur only with one article, which is always deleted. What that article is was discussed under the Distributive section.

It has been claimed (Chomsky orally, Hall (1962a, 1962b, 1963a), Postal (1967) that the definite analog of (248.b) is (249):

- (249) Three of the boys are here.

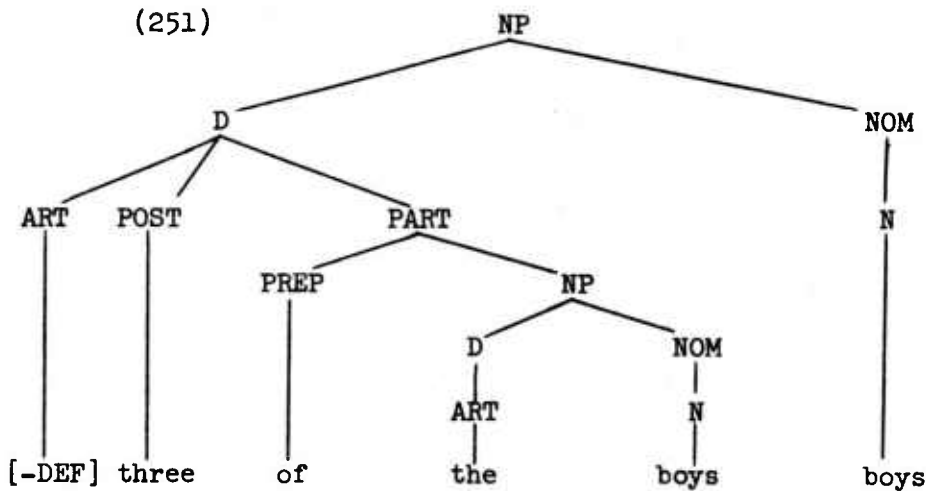
(Perhaps (247.b) is claimed to be ambiguously related to both (247.a) and (249); that has never been made clear in such a proposal.) We are rejecting that analysis and claiming rather that (249) is derived from (250).

- (250) Three boys of the boys are here.

Of the boys is considered a modifier of the first boys, which is the head N.

We thus posit a "partitive" construction as underlying what on the surface is a prearticle construction. The partitive is introduced by the rewrite rule:  $D \rightarrow \text{ART} (\text{POST}(\text{PART}))$ .

Under this analysis, three of the boys has the deep structure of (251):



Transformations operate on (251) giving the derivation of (252).

- (252) (a) Three [of the boys] boys -->  
 (b) Three boys [of the boys] -->  
 (c) Three ones of the boys -->  
 (d) Three of the boys

Once three of the boys is analyzed as deriving from three boys of the boys, there is no longer any justification for a PRE-article position. Since the indefinite article is always deleted with QUANT, only the three boys is left to offer information about the position of QUANT, namely that it follows ART. (All the boys is not an exception, since it is an optional variant of All of the boys.)

In the present treatment, therefore, all quantifiers are post-articles. Those which cannot occur with a preceding definite article (\*the all boys, \*the every boy, etc.) are required by a contextual feature to occur with a particular article which is later deleted; see discussion of DIST above.

The arguments for and against a partitive analysis have been presented in II.B.2. Let us note here some motivations for the particular partitive analysis we have chosen.

Partitives have not been considered a case on N for several reasons. Foremost among them is the fact that there are no nouns having idiosyncratic constraints on PART as they do on all other cases. I.e., PART apparently is a live option for every noun. Second, if PART is considered one of a string of cases following N, it would

be difficult (impossible?) to state identity conditions for deletion of items preceding PART. Third, it would be necessary to block all trees having PART where other cases preceding PART were not identical to those under PART. I.e., phrases like (253) would have to be blocked.

(253) \*three from John of the six gifts to Mary

Fourthly, PART has no counterpart within PROP.

One way to avoid some of these problems would be to postulate PART as an alternative to the cases on N, i.e. by a rule like (254):

$$(254) \text{ NOM} \rightarrow \left\{ \begin{array}{l} \text{NOM} \quad \text{S} \\ \text{N} \left\{ \begin{array}{l} (\text{ESS}) (\text{NEUT}) (\text{DAT}) (\text{LOC}) (\text{INS}) (\text{AGT}) \\ (\text{PART}) \end{array} \right\} \end{array} \right\}$$

However, this distinction is rather ad hoc and still has the disadvantage of reducing the parallelism between NOM and PROP. Furthermore, neither this nor a true case analysis of PART permits the necessary statements of the restrictions between PART and other parts of the determiner.

Any POST permits the occurrence of a PART, and this generalization is captured in our analysis by the nesting of the options (POST (PART)). However, the given rule does not account for the fact that in some instances a PART may appear without a POST, as in the examples below.

(255) (a) The ones of the boys who you met are here  
(perhaps the ones  $\Rightarrow$  those obligatorily;  
the REL is essential in any case)

(b) Some of the boys are here (some is ART)

(c) ?The boys  $\left\{ \begin{array}{l} \text{of} \\ \text{among} \end{array} \right\}$  the group protested.

The issue is complicated by the fact that it is not clear whether among-phrases should be included in PART; their occurrence is certainly much less restricted than that of of-phrases. Clearly if the Distributives were all analyzed as ART, the rule would best be changed to

D  $\rightarrow$  ART (POST) (PART)

with the remaining restrictions on PART represented as contextual features on ART wherever possible. The combination of the and PART, whether without POST as in (255.a) or with it as in (256) below, always requires a restrictive REL.

(256) The three of the boys who disagreed left.

The fact is not easily stated if the REL is derived from NOM S, but is even harder to state if PART is not part of DET.

There are a few other special restrictions which the PART construction entails. Among them are the following.

(a) Indefinites

It has been suggested that indefinites do not appear on the article of the PART NP. Perhaps there is a dialect difference here, for some speakers accept the following sentences.

(257) One of some boys who were playing in the alley got arrested.

(258) He ate three of some apples he found on the ground.

(b) Singular

The possibility of singular N's appearing in the PART appears doubtful. The use of fractions is only an apparent counter-example. Cf.

(259) One-half of the broom is red.

Such constructions fail the topicalization test (260), the paraphrase test (261), and the non-generic test (262).

(260) \*Of the broom one-half is red.

(261) \*One half broom of the broom is red.

(262) One-half of a broom is not very useful.

(c) Generic

It has been generally agreed that a special restriction must be placed on the PART article to disallow generics. Cf.

(263) \*One of boys/a boy should emulate great heros.

(264) \*One of the lion is a fierce animal.

It also seems true that a generic head N can not have a PART on it.

(265) \*The short-tailed (dog) of the dog is quite unattractive.

(266) \*The miniature (greyhound) of the American greyhound(s) is a popular dog.

(d) ORD and CHIEF

ORD's and some CHIEF's may be used on the head N with a PART.

(267) The second of the five cooks is dishonest.

(268) The last of the James brothers was shot 15 times.

(269) The lower of the supporting beams is cracked.

(270) ?The inner one of the locked doors has a very heavy iron bolt.

(271) \*The main (one) of the speakers couldn't make it.

All ORD's and CHIEF's occur happily in the PART NP.

(272) The second of the first five cooks is dishonest.

(273) One of the next batters will bunt.

(274) Two of the lower beams are cracking.

(275) Two of the inner doors are locked.

(276) Two of the main speakers couldn't make it.

In sum, with the exception of the idiosyncratic restrictions on CHIEF's on head N's, no new restrictions seem to be required for ORD and CHIEF in partitive constructions.

## (e) Person and Number Agreement

Partitives raise some problems in pronominalization and other anaphoric processes which depend on identity of person and number features. Apparently the identity can always be on the N of the final partitive but it sometimes can also be on preceding N's. It seems that only in forms which overtly allow one to remain as a pro-N for a pre-partitive N can the identity be on that N.

(277) All (\*ones) of us { like our milk cold, don't we?  
\*like their milk cold, don't they? }

(278) Each (one) of us { like our milk cold, don't we?  
likes his milk cold, doesn't he? }

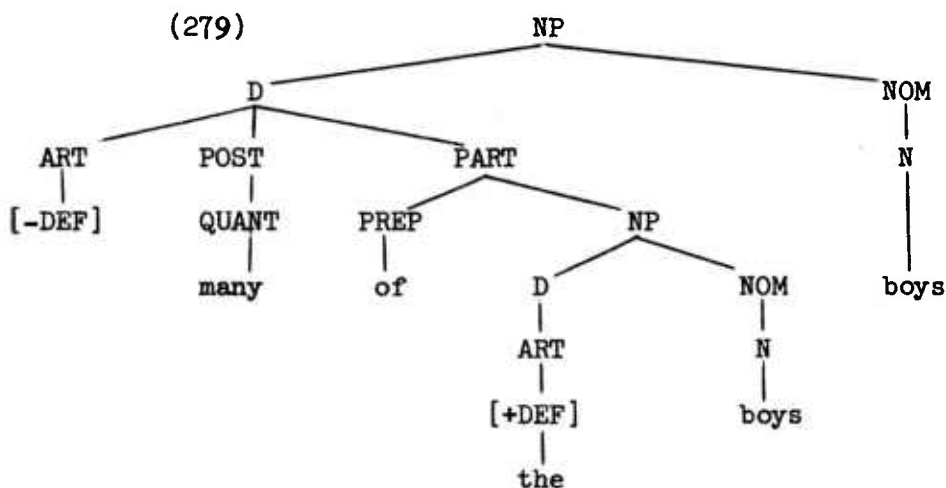
None, few, some, several, many, most seem to work like all; no, every, either, any seem to work like each.

## C. Transformations

1. Derivation of many of the boys

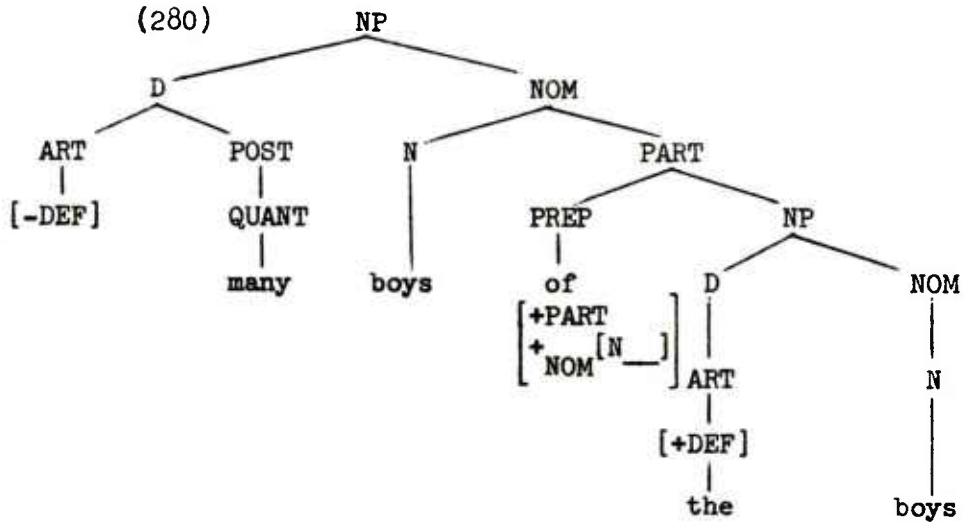
One of the attractive features of the proposed analysis for quantifier constructions is that almost no transformations are used which are not needed elsewhere anyway. A special reordering rule is required to move the PART to post-N position; and pronominalization of the repeated N to one has to apply backwards in these cases (see PRO). (It would be tempting to try to have the pronominalization rule apply forward before PART is moved, but it is not clear whether the PART-movement rule can be ordered that late in the grammar; we therefore assume here that PART-movement precedes PRO-ing.) The PART-postposing rule is stated below in section C.2.

(a) Base: many [of the boys] boys



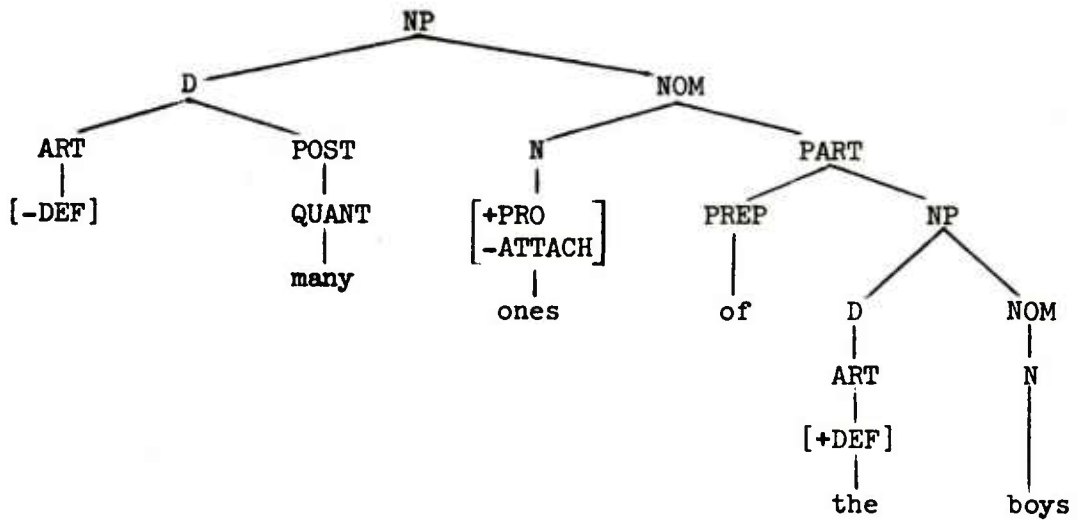


(b) PART - postposing  $\Rightarrow$  many boys of the boys



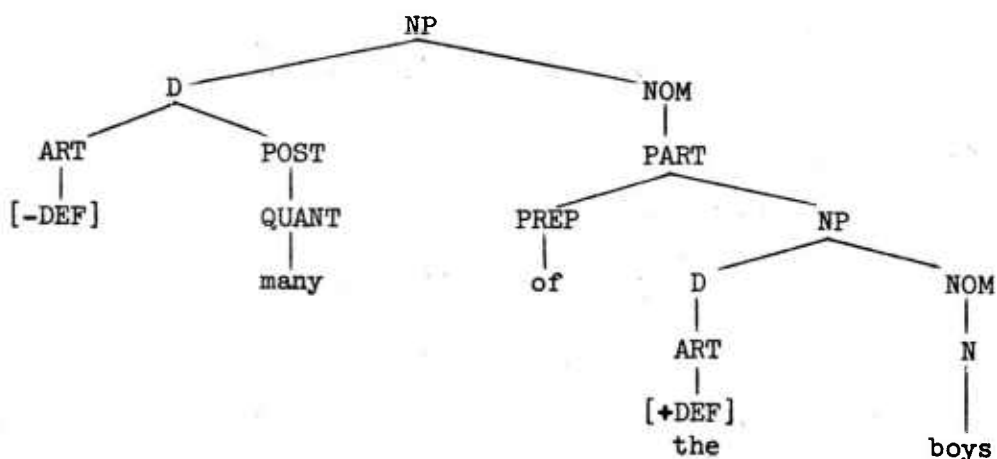
(c) Reduction of boys to ones, yielding many ones of the boys (See PRO)

(281) PART N-Node Reduction  $\Rightarrow$



(d) Deletion of one(s) after any item marked [+N DEL] (see PRO), yielding many of the boys, the final form.

(282) DELETION OF N-NODE  $\Rightarrow$



## 2. Idiosyncratic Determiner Transformations

(Note: These transformations are presented in an abbreviated format since they are all "minor" rules.)

### (a) T PART-POSTPOSING

Structure Index:

X	D	[X PART]	NOM	[N]	X
1	2	3	4	5	

Condition:

Obligatory

Structure Change:

Attach 3 as right sister of 4  
Erase (original) 3

Notes

1. The PART is adjoined to the head N of the NP; thus any relative clause on the PART precedes those on the head; cf. ex. (176) in Section II.B.2 above.

## Examples

(283) Three (boys) of the boys left.

(284) One (boy) [of the boys who were singing] who was not watching the conductor lost his place.

(b) T ALL - THE

## Structure Index:

X - {all } - of - ART[+DEF] - X  
 1        2        3        4        5

## Condition:

Optional

## Structure Change:

Erase 3

## Examples

(285) All (of) the boys went home early.

(286) \*Many the boys went home.

(c) T ALL-THREE

## Structure Index:

X - all - ART  $\begin{bmatrix} +DEF \\ -DEM \end{bmatrix}$  - QUANT[+INTEGER] - X  
 1        2        3        4        5

## Condition:

Optional

## Structure Change:

Erase 3

## Notes

1. This rule can only apply after T ALL-THE, but its statement makes the ordering intrinsic.
2. Example (287) below has two successive QUANT's in its surface structure. However, the facts that (i) (287), (288), and (289) are synonymous and differ in meaning from (290), (ii) two successive QUANT's cannot normally occur, indicate that this transformation is correct and two successive QUANT's are to be excluded from the base (except possibly for certain Distributives, as discussed above).

## Examples

- (287) All three boys left early.
- (288) All the three boys left early. (by non-application of this rule)
- (289) The three boys all left early.
- (290) (\*)Three boys all left early.

## Problems

1. Example (291) below is also synonymous with (287) and (288) above, but (291) is derived from (292), using both T ALL-THE and T ALL-THREE.

- (291) All three of the boys left early.
- (292) ?All of the three of the boys left early.

In addition to the fact that the synonymy of (291) with (287) and (288) is left unaccounted for, the source (292) contains as a subpart the NP (293), which in general obligatorily requires a restrictive relative clause, and yet (291) does not require a relative clause.

- (293) ...the three of the boys

If another rule were added to derive (291) from (294) (the source for (287-9)), (291) would be incorrectly predicted to be ambiguous.

- (294) All of the three boys left early.

2. The fact that (295) does not require a relative clause is probably significant but so far simply mysterious.

(295) ...the three of them...

(d) T QUANTIFIER MOVEMENT

Structure Index:

X	-	QUANT	[+SHIFT]	-	OF	-	NP	-	X	-	TNS	-	X
1		2			3		4		5		6		7

Condition:

Optional

Structure Change:

- (1) Attach 2 as left sister of 6
- (2) Erase (original) 2 and 3

Notes:

1. Number agreement applies after this rule:

(296) Each of the boys has examined the evidence.

(297) The boys each have examined the evidence.

2. Later positioning of these quantifiers appears to follow the rules for pre-verbal adverb placement (see NEG), so perhaps a node ADV should be inserted above these QUANT's when they are moved.

(298) The boys have each examined the evidence.

3. QUANTifiers marked [+SHIFT] are all, both, each, respectively.
4. These same items can appear in this derived position with conjoined NP's; see CONJ.

## Examples:

- (299) The children were all playing outside.
- (300) The floor was all wet.
- (301) Those books were both delightful.

## Problems:

The movement of the quantifier has repercussions not only for number agreement of the verb, but also for number agreement with other NP's in the sentence and even for grammaticality in some cases.

- (302) (a) Each of the boys examined himself for ticks.  
 (b) The boys each examined themselves for ticks.
- (303) (a) Each of the mountains is taller than the one to its south.  
 (b) \*The mountains are each taller than the one to  $\left\{ \begin{array}{l} \text{its} \\ \text{their} \end{array} \right\}$  south.

(e) T PROPER NOUN THE-DELETION

## Structure Index:

$$X - NP \left[ \begin{array}{c} [+DEF] \\ ART \quad [-DEM] \end{array} \right] N [-COMMON] - X$$

1                      2                      3                      4

## Condition:

Obligatory

## Structure Change:

Erase 2

## Notes:

1. This rule must follow pronominalization, since the personal pronouns are analyzed as articles--i.e., the article must still be present when pronominalization occurs.



2. Our analysis agrees essentially with that of Sloat (1968), in claiming that there are no special deep structure restrictions between DET and proper nouns, and that the non-occurrence of \*the Alfred is due simply to a late deletion rule.
3. Proper names which occur with the definite article, such as The Hague, The Amazon, The Rockies, The Pacific, would have to be marked with an exception feature under this analysis. Perhaps a fuller treatment could make use of the deleted nouns River, Mountains, etc.
4. The analysis of ART + N as NP is meant to exclude relative clauses, to account for the grammaticality of (204.b). This analysis suffices for the NOM-S or ART-S analysis of relatives but would have to be modified for the NP-S treatment.
5. Some nouns written with a capital letter must nevertheless be regarded as common nouns, both because they do not obey this rule and because semantically they do not name particular individuals; examples include American (as designation of inhabitant), Texan, Catholic. The normalcy of such phrases as the Smiths, the Kennedys, etc., could mean either that surnames are common nouns or that the rule applies only to singular proper nouns. Contrasts such as Orion vs. the Pleiades, Bermuda vs. the Azores, give some slight support to the latter view.

Examples:

- (304) (a) There are lots of Tracy's and not many  
Barbara's in my son's generation.  
(b) The Peter Smith that I knew played the bagpipes.  
(c) Most Elizabeth's have nicknames.  
(d) Which Paul were you talking about?
- (305) (a) \*We met the Susan at a cocktail party.  
(b) We met Susan at a cocktail party.

(f) T INDEF - BEFORE - QUANT DELETION

Structure Index:

X	- ART	$\begin{bmatrix} \text{-DEF} \\ \text{-DEM} \end{bmatrix}$	- QUANT -	X
1		2	3	4

Condition:

Obligatory

Structure Change:

Erase 2

Notes:

1. The fact that the deleted article may be either [+SPECIFIC] or [-SPECIFIC] accounts for the ambiguity of examples like (306) below. Dialects which find (306) unambiguously [-SPECIFIC] are not accounted for; it is not clear what becomes of corresponding deep structures with [+SPECIFIC] in such a position in such dialects. Perhaps the THERE transformation is obligatory for that situation, yielding there were five questions that John couldn't answer.

The [<sup>±</sup>SPECIFIC] distinction in the deleted article also accounts for the distinction between (307.a) and (307.b) below, a distinction parallel to that between some ([+SPECIFIC]) and any ([-SPECIFIC]). (Some speakers dislike (307.b) and find (307.a) ambiguous.)

(306) John couldn't answer five questions.

(307) (a) Ten of the books weren't on the shelf.  
([+SPECIFIC])

(b) Not ten of the books were on the shelf.  
([-SPECIFIC])

2. The feature [-DEM] is included in the S.I. so that what will not be deleted. We have no strong intuitions about the demonstrative some with respect to deletion; we do not delete it because doing so would both complicate the rule and predict an added ambiguity which we do not feel to be present.

(308) (a) What three books would it be most valuable to read?

(b) What two American cars have rear-engine drive?

(309) (a) ?Some three students will surely volunteer to help.

(b) ?Some two of the problems must have had the same answer.

$$(310) * \left\{ \begin{array}{l} \text{What} \\ \text{Some} \end{array} \right\} \left\{ \begin{array}{l} \text{every} \\ \text{each} \\ \text{all} \end{array} \right\} \text{ student(s) can solve all the problems.}$$

Example (310) is currently generated, though it clearly should not be. However, extending the deletion rule to delete [+DEM] articles before [+DIST] quantifiers would unwarrantedly predict additional ambiguities. Hence the avoidance of (310) should be a matter of deep structure constraints, e.g., by analyzing all [+DIST] quantifiers as ART.

3. This rule must follow NEG ATTRACT (cf. NEG) so that the [+INDET] article which attracts NEG will still be present, accounting for the position of NEG in sentences like (307.b). On the other hand, it must precede ANY-NO SUPPLETION so that the sequence NEG-any-QUANT (i.e.

NEG -  $\left[ \begin{array}{l} -\text{DEF} \\ -\text{DEM} \\ \text{ART } +\text{INDET} \end{array} \right]$  - QUANT) is realized as not-QUANT, not

as no-QUANT.

- (311) (a) \*No many people arrived.  
(b) Not many people arrived.

Phrases such as any three, no three, etc. are not generated in our grammar and it is not clear how they should be analyzed. Since no three and not three have distinct meanings, optionality of the rule for certain QUANT's does not appear to be the answer.

4. This rule must precede QUANTIFIER MOVEMENT, so that we have a derivation such as an each of the boys  $\Rightarrow$  each of the boys  $\Rightarrow$  the boys each; the opposite order would give an each of the boys  $\Rightarrow$  \*a the boys each, to which this rule could not apply.

#### D. Unresolved Problems and Unexplored Areas

1. There is an ADV of degree that can appear in the QUANT, probably originating modifying many/much. It includes nearly, almost, and may include the integers and such quantifiers as cupful, pound, but detailed treatment of it awaits general work on adverbs.

Hale (1964) has thoroughly explored the possibility of employing adverbials within the DET not only for measure phrases (Degree) but also for some comparative constructions; but no adverbs have been included in this grammar.

2. Fractions and words like majority have not been analyzed at all.

3. Superlatives, in the surface structure at least, seem to have a good bit in common with ORDinals. Note in particular the infinitival complement which can occur with superlatives and ORDinals but not with ordinary adjectives or other determiners:

- (312) (a) The first American to be killed in Vietnam was X.
- (b) The worst play to be produced on Broadway was X.
- (c) The oldest student to be admitted was X.
- (d) \*The old student to pass the exam was X.
- (e) \*These students to pass the exam were X.

In this respect only also seems to function as an ORDinal.

- (313) The only student to pass the exam was X.

Note that these infinitival complements are distinct from those apparently derived from ordinary relative reduction where there appears to be an underlying be to:

- (314) (a) The people to leave tomorrow should pack tonight.
- (b) That is not an idea to sneeze at. (from to be sneezed at?)

4. When there is a definite article preceding QUANT OF NP there must be at least one relative clause associated with that QUANT.

- (315) (a) \*The one of the boys is talking.
- (b) The one of the boys who is interested is talking.
- (c) The one of the boys who is/are in the room who is interested is talking.
- (d) \*The one of the boys who are in the room who are interested is talking.

It makes no difference how many, if any, relative clauses are associated with the inner NP as long as there is at least one associated with the outer one. There is no such restriction when the first the does not occur. This restriction is perfectly clearcut, and in fact lends support to the proposed analysis, but we do not see any natural way to state it.

5. In CONJ it is argued that number agreement between subject and AUX should be stated for surface structure (i.e., following AUX-inversion). We have not tried to work out such a rule; we have in fact argued that CONJ number agreement may be separate from ordinary number agreement, in which case ordinary (i.e. non-CONJ) number agreement for American English (i.e. \*the family are) can be made to depend simply on the number of the head noun of the noun phrase.

Number agreement between noun and determiners is subsumed under the feature-copying rules in PRO.

Number agreement between noun phrases across the copula is assumed to be a matter of semantic, not syntactic, anomaly, so we are generating:

- (316) (a) His diets are a nuisance.
- (b) His diet is oranges.
- (c) Cinderella will be two pumpkins.
- (d) Two men are the horse.
- (e) Dogs are a good pet.
- (f) Mary is three people.
- (g) John is naughty boys.
- (h) Those children are a good girl.

etc.

6. This and that, these and those have some peculiarities.

a. This appears sometimes to be a kind of indefinite article in what may be a substandard dialect, or at least extremely colloquial:

- (317) (a) When I walked into the room, I saw this girl sleeping on the sofa, so I left.
- (b) There's this problem we keep running into about how to attach features to higher nodes.

This this appears to be slightly more specific than a, but not in any contrast with that. It is especially frequent in substandard narrative style:

- (318) There's this guy and he has this horse and this other guy tries to get it...

b. The following are not paraphrases.

- (319) (a) Get me that red pillow on the sofa.  
 (b) Get me that red pillow on the sofa.

However, given sufficient preceding context, the difference might be representable as depending on repetition vs. contrast: in (319.a) the "red pillow" is the one already mentioned, so nothing is stressed, while in (319.b) the "red pillow" desired is being distinguished from some other red pillow on the sofa. Hopefully, then, these cases could be made to follow Gleitman's rules of stress for repeated and non-repeated material, extended to apply optionally on first occurrence to represent non-linguistic preceding context.

c. The pronominal forms have some peculiarities discussed in PRO.

7. What, which, and who have been treated, but the extension of this analysis to where, when, etc., is not worked out because ADverbs are not treated in this grammar.

8. Mass and plural nouns share some properties and should probably have a feature in common (opposed to count singular); we have not introduced any such feature. It does not seem advisable to represent them as any more closely related than singular and plural count nouns or than singular mass and count nouns, since the present [\*PLural] distinction accounts for number agreement of this/these, that/those and of the verb phrase, while the present mass/count distinction accounts for replaceability by the reduced noun one(s) and co-occurrence with integers. A feature shared by mass and plural would account for the a/sm distinction.

9. There are some restrictions on the NP which follows a COP BE, and in this section we are concerned with those on the DET in particular.

First, we note that [+DIST] items can occur in this position only if the NP contains an S.

- (320) (a) \*They are both/each/all/any/either of his daughters.  
 (b) \*They became both/each/all/any/either of his  
       two/many cars.  
 (c) \*They are both/each/all the daughters.
- (321) (a) They are all the daughters he has.  
 (b) That is every cent he has.  
 (c) Those are all the lummoxes I know.

Apparent counterexamples to this generalization are the following:



- (322) (a) There/here are all/each/both of his (two) daughters.

But the NP of (322.a) is actually the subject in the deep structure, viz. All/each/both of his (two) daughters are there/here.

- (322) (b) They are all/each/both dancers.

Again the counterexample is only apparent since the deep structure is All/each/both of them are dancers. Note that All of them became dancers underlies They all became dancers just as All of them are dancers can optionally become They all are dancers.

Example (323) is interesting since its ambiguity is tied into an apparent counterexample. One source of the sentence is (321.a). The other is All of them are his daughters which is like (322.b) above.

- (323) They are all his daughters.

A possible feature specification for [+DIST] QUANTifiers is thus:

- [COP [ART\_\_\_N(ADV)]]  
NP

A second restriction that apparently should be made on predicate NP's is that they should not contain a [+SPECific] indefinite article. In simple sentences we have no clear test for determining whether the article a in a predicate nominal is [-SPECific] or possibly generic, as in John is a pacifist, John is a boy I met at a demonstration last year, etc. However, since relativization hinges on the [+SPECific] indefinite article, that article must be excluded from predicate nominal position to prevent deriving \*the teacher that John is, etc.

10. Since we do not in general assign features to the node NP, we have not made any serious attempt to describe the role of the partitive in determining certain properties of the NP in which it occurs. There are a number of examples where the partitive has significant effects for pronominalization and for the formation of imperatives, but we have no way to account for the relevant distinctions.

- (324) (a) All of you have incriminated yourselves  
(\*ourselves, \*themselves).  
(b) All of us have incriminated ourselves (\*your-  
selves, \*themselves).

- (325) (a) One of you please come to the blackboard.  
(b) One of the boys near John please tell me what he wants.  
(c) \*One of them please come to the blackboard.  
(d) \*One of the boys near you please tell me what John wants.
- (326) (a) Every one of you has betrayed your country.  
(b) \*Every one of you has betrayed your wife.  
(c) Every one of you has betrayed his wife.

July 1969



## PRONOMINALIZATION

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## PRONOMINALIZATION

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## II. INTRODUCTION

### A. General Framework

We are concerned here with the phenomenon of pronominalization, understood roughly as the use of reduced or suppletive forms "in place of" part or all of a noun phrase (we will not be dealing with the often similar pro-ing of other constituents such as PROP or S). We are concerned primarily with the relationship between various aspects of pronominalization which previously have been treated more or less separately. In particular, we try to show that the reduction of a repeated N to one(s) in either a definite or an indefinite NP is independent of reference and can be stated in purely formal terms, and that the same is true of deletion of the resulting pro-form one(s) immediately following certain determiners. Anaphoric personal pronouns are argued to arise through this process when N-reduction to one and subsequent deletion of one leaves an NP consisting only of a definite article; thus it is claimed that the has suppletive variants he, she, it, they. Under such an analysis, coreferentiality plays no direct role in any of the processes subsumed under pronominalization: its role is rather in the process (if it is a process) of definitization. The general analysis is that proposed in Wolfe (1967), which in turn draws heavily on the work of Gleitman (1961), Postal (1966b), and Fillmore (1966d). We believe that Kuroda (1966b) was the first to suggest the possibility and utility of regarding pronominalization and definitization as two independent processes instead of regarding the formation of personal (i.e. definite) pronouns as a unitary process distinct from other types of pronominalization.

A caveat is necessary at the outset. As is clear from the bibliography, pronominalization is a topic which is currently receiving intensive scrutiny, and new insights and proposals are appearing at an ever-accelerating rate. Furthermore, much of the most interesting of this research is concerned with elucidation of the relation between semantics and syntax, and serious doubt has been cast by it on the possibility of constructing an "autonomous syntax." It is obviously impossible to take full account of everything written right up to the present; what is more unfortunate is that the framework of this project does not readily permit inclusion of some of the available insights that seem in large measure correct. In particular, for example, Lakoff has recently suggested (La Jolla Conference 1969) an important general distinction between pro-ing by identity of sense vs. pro-ing by identity of reference which appears at first sight to avoid the major problems discussed in II.C. below. And Postal's crossover constraints cannot be invoked at all in our grammar even where we might want to agree with them, since our case grammar framework reverses many

of the crossover properties of standard grammars by starting out with typical objects (neutral case) preceding typical subjects (agent case).

It is hoped that the observations made in this report will be useful despite such shortcomings, since (a) we have included much that is common to many treatments of pronominalization; (b) the formal aspects of the relation between anaphoric and non-anaphoric pronominalization are dealt more with here than in most other treatments; and (c) the impossibility of dealing adequately with certain types of phenomena purely syntactically is here demonstrated quite impartially.

One of the central aims of our analysis is to show a close relationship between the apparently distinct phenomena illustrated below.

(a) One (s) apparently can replace a repeated noun when that noun is the only element in common in a pair of non-coreferential noun-phrases.

(1) John bought a red pencil and Bill bought a blue pencil. ⇒  
John bought a red pencil and Bill bought a blue one.

(b) One (s) apparently can also replace an entire indefinite NP which is non-coreferential with some identical NP in the sentence.

(2) John bought a red pencil because Bill had a red pencil. ⇒  
John bought a red pencil because Bill had one.

(c) One (s) also seems to replace structures which are neither just nouns nor whole NP's.

(3) John likes long round pencils and Bill likes short round pencils. ⇒ John likes long round pencils and Bill likes short ones.

(d) Sometimes a repeated noun or noun plus some modifiers is deleted instead of being replaced by one (s).

(4) John bought three (red) pencils and Bill bought four (red) pencils. ⇒ John bought three (red) pencils and Bill bought four.

(e) A whole NP is replaced by a personal pronoun when it is coreferential with its antecedent.

(5) John caught a fish and cooked the fish. ⇒ John caught a fish and cooked it.

The core of our proposed analysis is as follows:

- (i) The replacement of a repeated noun together with certain of its repeated modifiers by one(s) is a process independent of coreferentiality and common to all of the sorts of pronominalization illustrated above.
- (ii) Definitization, if it is a rule at all, precedes pronominalization and is crucially bound up with coreference. Coreference can almost (though not completely) be ignored in pronominalization without creating semantically undesirable results.
- (iii) After certain determiners, pronominal one(s) is deleted. In some cases, e.g. three, four, no further changes occur (ex. (4)). In other cases there are morphophonemic changes in the determiner, e.g. my  $\Rightarrow$  mine, no  $\Rightarrow$  none, etc.
- (iv) It is argued (following Postal (1966b) on definites and reversing Perlmutter (1968) on indefinites) that one of the environments in which one(s) is deleted is following an article, and that analogous to the my-mine alternation is a more radical suppletion, namely between a and one and between the and all the personal pronouns.

This analysis applies to the above examples roughly as follows (leaving details to be discussed later):

Sentence (1) illustrates only repeated noun replacement by one. Sentence (3) illustrates the same, with deletion of a repeated modifier as well. Sentence (2) would have the following stages:

- (2a) ...because Bill had a red pencil  $\Rightarrow$  [by reduction of noun and modifier to one]
- (2b) ...because Bill had a one  $\Rightarrow$  [by deletion of one after article]
- (2c) ...because Bill had a  $\Rightarrow$  [by suppletion of article in stressed position]
- (2d) ...because Bill had one

Notice particularly that the one which appears in (2) is a suppletive form of a, whereas the one in (1) and (3) is the replacement for a repeated noun. Sentence (4) also illustrates noun (plus modifier) reduction to one followed by one-deletion. Sentence (5) has the same stages as sentence (2), namely:

- (5a) ...cooked the fish  $\Rightarrow$  [by noun reduction to one]
- (5b) ...cooked the one  $\Rightarrow$  [by deletion of one after article]
- (5c) ...cooked the  $\Rightarrow$  [by suppletion of article in stressed position]
- (5d) ...cooked it.

(The (c) stages of (2) and (5) are fictitious: the suppletion is actually a matter of second lexical look-up at the surface structure level, and no phonological shape is supplied until then.)

In what follows, we first describe the proposed analysis, incorporating some of the discussion of other proposals where directly relevant. Further annotation is included in the subsequent sections which discuss problems with our analysis and problems in pronominalization in general.

## B. Processes Involved

In discussing our analysis of pronominalization, we first treat four phenomena which precede "pronominalization proper", namely definitization, reflexivization, feature transfer from noun to determiner, and surface case marking. Section 2 describes pronominalization proper, i.e. noun reduction to one, modifier deletion, and one-deletion. The third section discusses the source of pronouns which have no antecedent within the same sentence.

### 1. Processes Preceding Pronominalization

a. Definitization. It has been argued (Kuroda, 1965, 1966b, and Postal, 1966b) that the first step in pronominalization to personal pronouns is definitization. Thus while Gleitman (1961) derives both (6.b) and (6.c) from (6.a), Kuroda and Postal derive (6.c) from (6.a) only through the intermediate stage of (6.d).

- (6) (a) I saw a man and you saw a man. [Gleitman 28.a]
- (b) I saw a man and you saw one.
- (c) I saw a man and you saw him.
- (d) I saw a man and you saw the man.

Gleitman also allows (6.c) to be derived from (6.d), but does not require (6.d) to be a prior stage of (6.c) as Kuroda and Postal do. All are agreed that (6.c) and (6.d) carry an interpretation of coreferentiality while (6.b) does not. The advantage of deriving (6.c) only via (6.d) is that such a derivation captures the close relation between definitization and coreferentiality. Further justification of this claim will appear below (II.C.3) when we discuss the problem of whether definitization should be a rule or not. For the time being, we assume only that definite articles are introduced at some stage prior to pronominalization proper (possibly at the deep structure level), so that we can follow Kuroda and Postal in deriving personal pronouns only from definite NP's.

b. Reflexivization. We agree with Postal (1966b) in considering reflexivization a separate process from pronominalization, in

contrast with Fillmore (1966a), who unites reflexivization and pronominalization into one rule. Lakoff and Ross (1966b) have reflexivization as rule #40, whereas pronominalization is #52; some of the rules intervening are It-replacement, Question, Topicalization, Subject Inversion, Extraposition and Adverb Preposing. Lakoff (1968b) claims that in fact pronominalization must be post-cyclic, and Postal (1968) has a still later second reflexivization rule.

As was pointed out by Lees and Klima (1963), for reflexivization to occur the two NP's must be within the same simplex sentence. In this analysis

- (7) He wrote a book about himself.

is considered to be derived from one sentence, whereas

- (8) He kept the book near him.

would be derived from two sentences. (Lees and Klima noted, however, that reciprocals do not have the restriction of occurrence within the same sentence, since we have:

- (9) They placed their guns in front of them. vs.

- (10) They placed their guns in front of one another.

However, reciprocals may not occur freely in subordinate clauses. Lees and Klima note this problem, but have no solution.)

Postal (1968) has stated that the constraint on reflexivization that the two NP's must be within the same simplex is not applicable at the level of Deep Structure but rather at some point between there and Surface Structure. That it is not relevant at the level of Deep Structure is demonstrated by

- (11) (a) I believe myself to be correct about that. [2(4)a]  
(b) Margaret found herself unable to move. [2(4)b]

Postal wished to relate these to:

- (12) (a) I believe that I am correct about that. [2(5)a]  
(b) Margaret found that she was unable to move. [2(5)b]

in which the coreferential NP's are in different clauses. He proposed no derivation demonstrating this relationship, but presumably had in mind something like our rule of Subject-to Object raising (see NOM section).



Within the lexicalist framework adopted by this project, the notion of 'simplex S' must be extended to have an analogue in 'simplex NP'. Examples of reflexivization within the NP include:

- (13) (a) John's indictment of himself astonished everyone.
- (b) Rembrandt's portraits of himself are very famous.

A further point to be noted about reflexivization as defined by Lees and Klima is that it can only occur forwards, or left-to-right. i.e. we cannot get:

- (14) \*Himself killed John.

If, however, as seems probable, anaphoric definitization is a necessary prerequisite for reflexivization, then reflexivization would naturally be excluded from this environment (since definitization cannot work backwards) (cf. D.1.).

A further constraint on reflexivization is that in general passives cannot be reflexivized, as in:

- (15) \*She was admired by herself.

Postal (1968) deals with this constraint as one example of restrictions on the crossing by transformational rule of two coreferential NP's. Although Postal has many important insights in connection with his crossover principle, we do not discuss them here partly because the work appeared too recently to be adequately dealt with and partly because the case grammar framework makes a great deal of difference in which NP's are crossed by which rules. In particular, in our grammar active subject placement crosses the subject over the object, but passive subject placement does not. Thus in our grammar an ad hoc restriction must be placed on the reflexive rule to exclude (15). There would not be any "crossover" involved in the derivation of such phrases within our case grammar approach; see discussion of passivization in the Case Placement Rules section.

c. Feature Transfer and Surface Case Marking. We follow Fillmore in transferring from the noun to the determiner all features relevant for pronominalization, i.e. gender, number, animacy, etc. We differ from Postal (1966b) in that we have a separate determiner node, rather than using a rule of segmentalization to separate out the determiner at a later stage (cf. DET for full discussion). We also follow Fillmore in assigning surface case directly to the determiner. We realize that since many languages require surface case endings on the noun also it would in principle be better to



assign surface case to the head noun and then spread it onto the determiner with other features. This rule, is, however, simpler for English, since the head noun is somewhat awkward to specify. (Note that many languages require case endings to be assigned to modifiers also, which would suggest case is a property of the whole NP. However, there is considerable divergence between languages as to whether all modifiers require endings, depending on such matters as pre- vs. post-nominal position, etc. Since this is not relevant to the grammar of Modern English we leave the matter to others to investigate.) We take the nominative case as the basic form, and assign objective case, which seems simplest for the standard dialect. Klima (1964d) has arguments for choosing objective case as the base form for advanced colloquial English, and also discusses the effects of ordering the rules in different ways to relate different dialects. Our concern is however solely with the standard dialect, so we have made no attempt to incorporate these variations.

Although we follow Postal (1966b) in analyzing reflexive pronouns as D + N, we do not (as he does) assign a feature [+Genitive] as a consequence of reflexivization. This seems to be redundant, since it is completely predictable from the feature [+Reflexive]. Further, it seems of dubious accuracy; only myself, ourselves, yourself, and yourselves are unambiguously genitive, whereas himself and themselves are unambiguously accusative.

These processes, definitization, reflexivization, feature transfer and case marking, are in a sense peripheral prerequisites to the transformational rules which actually perform the work of pronominalization. (This is not to suggest that they are unimportant, or that they do not raise many difficult problems.)

## 2. Pronominalization Proper

Let us now examine the process of pronominalization itself in more detail. An early proposal for the reduction of the noun node to one was that of Gleitman (1961), who observed that under conjunction repeated material loses stress, whereas non-repeated material gains stress, as in:

(16) Í saw a man and yóu saw one. [9]

(17) Í saw tóo men and yóu saw óne. [10]

She further claimed that pronominalization and deletion were related to stress reduction, in that in the second conjunct everything after the last-stressed morpheme (i.e. everything which is a repetition of material in the first conjunct, and therefore unstressed) can be pronominalized, as in:

- (18) (a) I saw a house and you saw one. [20]  
 (b) I saw a big house and you saw a small one. [21]  
 (c) I saw a big brown house and you saw a small one. [22]  
 (d) I saw a big brown brick house and you saw a small one. [23]  
 (e) I saw a dilapidated big brown brick house and you saw a fine one. [24]

in which one replaces a house (18.a), house (b), brown house (c), brown brick house (d), and big brown brick house (e).

Note that in (18.b-e), i.e. in all the cases where there are distinct modifiers on the nouns, the indefinite articles could be replaced by definite articles with no change in the behavior of one (s). Thus at least in the presence of appropriate modifiers, noun reduction to one is independent of the definite/indefinite distinction. Gleitman and others did not go on, as we do, to claim that essentially all pronominalization has reduction to one as one step, perhaps because cases which result either in personal pronouns or in deletion of the noun altogether show no traces in their surface form of having undergone noun reduction to one. Gleitman did notice that one is deleted if it immediately follows one of a large number of determiners. The data can be summarized as follows:

(i) One (s) is never deleted after ordinary adjectives, nor after every:

(19) After looking at some modern sculptures, John bought---

- (a) an ancient {one  
\* $\emptyset$ }  
 (b) every {one  
\* $\emptyset$ }  
 (c) a particularly striking {one  
\* $\emptyset$ }

(ii) One (s) is optionally deleted after either, neither, each, another, and some other determiners.

- (20) (a) Both forms are acceptable; neither (one) is ungrammatical.  
 (b) Among currently considered proposals, each (one) has serious flaws.  
 (c) If you don't like that course, sign up for another (one).

(iii) One (s) is obligatorily deleted after certain determiners, which then may have alternate surface forms.

- (21) I looked at all the books and eventually bought {some  
a few  
many  
several  
three  
his} (\*ones).

Among the suppletions accompanying one-deletion are my/mine, your/yours, our/ours, her/hers, no/none, other/others.

It might be argued that sentence (21) does not show deletion of ones, but that rather the noun books was simply deleted direct instead of being first replaced by ones. There are at least two moderately strong arguments against such a claim, neither overwhelming. (i) A single rule which sometimes replaced nouns by one (s) and sometimes deleted them would be fairly complex; it would have to indicate that the choice of structural changes depended on the determiner immediately preceding the part to be replaced (identical noun plus contiguous identical modifiers) and that in the case of deletion the remaining determiner is to be assigned a feature triggering the suppletive alternation. Since there must be two structural changes in any case, it seems formally simpler to state two separate rules.

(ii) A sentence grammar must somehow derive sentences such as (22.a-c):

- (22) (a) The brown ones are clean.
- (b) Some were broken in transit.
- (c) Mine are over here.

Without a mechanism for pronominalization on the basis of extra-sentential antecedents, noun phrases such as those underlined above must be somehow derivable from appropriately unspecified deep structure NP's. (22.a) can be generated simply by allowing in deep structure a noun one which has all the features which the pronominal one receives transformationally. (See below for further discussion of the underlying one.) But for (22.b) and (22.c), if we had no rule deleting one (s) after determiners like some and my, we would have to say there was no head noun in the underlying NP, thus radically changing the PS rules, the selectional restrictions on some, and the derivation of possessives like my. But if we need a rule deleting one (s) for these cases, we can use exactly the same rule for sentences like (21). Therefore within a sentence grammar there is quite substantive evidence in favor of splitting up the noun-deletion in (21) into noun-reduction to one and one-deletion.

Perlmutter (1968) argues that a and one are suppletive variants, a being the unstressed form of the numeral one. A critical discussion of his proposal can be found in DET. We agree that a and one are alternants, but consider them to be an indefinite article, not a cardinal number. We can therefore regard their suppletion as perfectly parallel to no/none, my/mine, etc., i.e. the indefinite article is one of those determiners after which the reduced noun one is deleted, and its suppletive form in derived head position

is one. Thus the derivation a one = one proceeds not as Gleitman suggests by deleting a, but by deleting the pronoun one and then introducing a different one as suppletive variant of a. Thus the case where an entire noun phrase ends up replaced by one is subsumed under the same processes of noun-reduction to one plus one-deletion.

The personal pronouns were considered by most authors before Postal (1966b) to arise from a process quite distinct from those discussed so far. It would appear on the surface that personal pronouns directly replace an entire NP, whereas one(s) replaces just a noun plus perhaps some of its modifiers. But the treatment argued for by Postal fits the personal pronouns into the same system (and in fact partly suggested this system). Postal argues that the personal pronouns are suppletive forms of the definite article, arising through derivations roughly as in (23).

- (23) ....boy<sub>i</sub>....the boy<sub>i</sub>....⇒ [by Noun-reduction to one]  
 ....boy<sub>i</sub>....the one<sub>i</sub>....⇒ [by one-deletion]  
 ....boy<sub>i</sub>....the ∅.....⇒ [by suppletion the/he]  
 ....boy<sub>i</sub>....he.....

If we can account for the many-one correspondence between the personal pronouns and the, and if we can account for the necessary coreferentiality in the case of the personal pronouns as opposed to one(s), then the derivation (23) would proceed automatically by the rules already required for other types of pronominalization.

The first problem, that of the many-one suppletion between the personal pronouns and the, can be readily accounted for, as Postal and Fillmore both suggest, by a prior agreement rule which transfers certain features of the noun to the determiner: this rule has already been discussed. As a result of it, the definite article can have a number of feature combinations in its surface structure; these complex symbols are all realized as the when one of their features is [-PRO], and as the various pronouns if [+PRO] is included. Postal's claim is that it is purely a surface fact of English that distinct forms indicating gender, case, and number are to some extent preserved in the third person pronominal forms, and are collapsed in the definite the. He notes that such distinctions must be present in the deep structure to allow us to get:

- (24) (a) the one who I saw behaved himself [32a]  
 (b) the one who I saw behaved herself [32b]  
 (c) the one who I saw behaved itself [32c]



The second problem, coreferentiality, is discussed in sections II.C.1 and II.D.2. It comes surprisingly close to being possible to simply ignore reference in these rules, regarding it as relevant only for definitization. This approach is not entirely satisfactory, however, and its problems are discussed in the sections mentioned above.

The arguments by which Postal supports the identification of the definite article and the third person pronouns are:

(i) that personal pronouns function as definite NP's, for which he provides several diagnostic tests

(ii) that self/selves in reflexive pronouns is a noun stem, preceded by a determiner, and that one (s) parallels this in non-reflexive cases

(iii) that we and you [+Plural] function as articles, as in:

(25) you men here

(26) we Americans who have been struggling here

(27) you lucky ones

(iv) that this analysis allows for third person pronouns also to have restrictive modifiers, as in:

(28) the one who Lucille divorced

(29) the small one

Third person pronouns are idiosyncratic in that one is retained when either a pre- or post-nominal modifier is present. With other determiners, only the presence (or not) of a pre-nominal modifier intervening between the determiner and the noun is crucial in determining whether or not one is deleted, as illustrated by:

(30) we  $\left\{ \begin{array}{l} \emptyset \\ *ones \end{array} \right\}$  (on the right side)

(31) we lucky  $\left\{ \begin{array}{l} *\emptyset \\ ones \end{array} \right\}$  (on the right side)

(32)  $\left\{ \begin{array}{l} *they \emptyset \\ the ones \end{array} \right\}$  (on the right side)

Postal's rule of Pronoun deletion will delete one only when there is no restrictive modifier at all. Since Postal is considering only the process which will lead to personal pronouns, i.e. the cases where one is preceded by a definite determiner, this is sufficient for his purpose; however, it is in fact only a special case of the

rule which deletes one when it immediately follows some, many, the [-Count], etc. In our analysis therefore we wish to capture this generalization. Note also that Postal considers only identity of noun stems when reducing the NP to one; he does not consider deletion of modifiers in the second NP. This is an important point since, as will be discussed below, deletion of modifiers is one area in which there are important differences between pronominalization resulting in a surface structure one and that resulting in a personal pronoun.

In summary, the pronominalization processes cited at the outset are seen to be closely related primarily by virtue of two rules: noun-reduction to one (s) with concomitant modifier deletion, and deletion of one (s) after certain determiners, with concomitant suppletion for some such determiners. The first rule is extremely general; the second reflects the idiosyncracies of various determiners, both in whether they require, permit, or disallow one-deletion and in their suppletive alternations. Further details are discussed with the rules, in section III.C below.

### 3. The Derivation of Deep Structure Pronouns

In order to account for pronouns which have not been pronominalized within the sentence, and to account for the ambiguity in his example:

(33) Schwartz claims he is sick. [6]

Postal wished to derive pronouns in the deep structure as well as from underlying NP's. We differ slightly in the details of our analysis, in that we would rather offer a derivation from a deep structure determiner the and one(s). We need to derive the one(s) in deep structure anyway, to get such sentences as:

(34) The one over there is my sister.

If we generate the one (s) without any pre- or post-nominal modifiers, then the noun node will be deleted and the personal pronouns result by the rules we have already postulated. Thus we can derive these forms without any extra apparatus at all. In this respect we differ very much from Fillmore, who has three possible configurations resulting from his PS rule:

NP → Det (N(S))

In Fillmore's analysis the configuration



selects the pronoun it which is used for the it-S analysis of



complement structures. Ignoring here the question of the validity of the it-S analysis, we note merely that if it were required, we still would wish to have a uniform derivation for it and to integrate it into our general process of pronominalization, if possible. (Some questions raised by the analysis proposed in "Fact", by Kiparsky and Kiparsky, seem to suggest that it is not possible to integrate the expletive it into the general process of pronominalization; cf. NOM.) If it were to be integrated, then this would require generating a determiner with a dummy noun rather than having no noun. Fillmore's rule will also give:



The determiner will result in a personal pronoun when the N is "lexically empty" and there is no S. This corresponds to the claim that "personal pronouns do not accept relative clause modification". (Fillmore, p.11). However, it is possible to analyze the one plus a relative clause as filling the gap, by restricting the rule deleting one after the so that it does not apply if there is a post nominal modifier. Otherwise two separate restrictions would be necessary to account for the following asymmetry:

- (35) (a) The man with a hat came in/The man came in  
 (b) The one with a hat came in/\*The one came in  
 (c) \*He with a hat came in/He came in.

That is, by deriving he from the one, we can avoid having any special restrictions on the occurrence of relative clauses either with personal pronouns or with one.

A detailed presentation of the features for these pronouns and determiners will be found in the sample lexicon. We note here only that we follow Postal in using the features [<sub>I</sub> I], [<sub>I</sub> II], [<sub>I</sub> III] to derive the various forms, rather than using Fillmore's hierarchical features of [<sub>I</sub> Participant], [+Participant] ⇒ [<sub>I</sub> Speaker]. Our motivation for this is that we cannot be simply considered as [+Speaker], [+Plural]. Instead, we need to derive:

- (36) You and I can't perjure ourselves.  
 (II + I = 1st. plural inclusive)
- (37) John and I can't perjure ourselves.  
 (III + I = 1st. plural exclusive)
- (38) You and John can't perjure yourselves.  
 (II + III = 2nd. plural exclusive)

- (39) You two boys can't perjure yourselves.  
(2nd. person plural inclusive)
- (40) You and John and I can't perjure ourselves.  
(II + III + I = 1st. person plural)

Indefinite pronouns are derived from deep structure dummy nouns one and thing with various determiners. We note here in passing that we adopt Postal's rule of Article Attachment to join these forms and also the determiners and stems of the reflexive pronouns.

### C. Problems with the Analysis

#### 1. Reference and N Reduction to One

In the treatments of pronominalization of Gleitman and of Lees and Klima, reflexivization and pronominalization proper are given as optional rules for third person, obligatory for first and second. Thus (42) would be an optional transform of (41):

(41) The man talked to the man.

(42) The man talked to himself.

Since in (41) the NP's can only be interpreted as non-coreferential and in (42) only as coreferential, it is suggested that the application of reflexivization amounts to a judgment of coreferentiality between antecedent and pronominalized NP. The fact that the rule is obligatory for first and (disputedly) for second persons reflects the fact that two occurrences of first or of second person pronouns in the same sentence can only be interpreted as coreferential.

Let us call the above approach to coreferentiality the LK approach.

Another approach is mentioned in Chomsky (1965, p. 146) and has been followed at least implicitly in most recent transformational work, in particular by all linguists who accept the Katz-Postal hypothesis. Let us call it the Index approach.

The Index approach is that reference (or at least sameness of reference) is to be marked in some way in deep structure, e.g. by indices on NP's. Then the relevant T-rules can be made obligatory (for all persons, not just third) and dependent upon coreferentiality as well as (or instead of?) formal identity.

In this project (cf. UESP 1967), the LK approach has been used, for a number of reasons.

(1) The primary reason was that pronominalization was found to be analyzable as a sequence of relatively independent steps, of which the most central ones do not depend on coreferentiality at all. Thus, if we put aside temporarily the question of the origin of definite articles, it appeared that none of the steps in non-reflexive pronominalization, namely reduction of a lexical N to one and deletion of one in certain environments, required mention of referential identity.

- (43) (a) When John's yellow shirt tore, he had to buy a new one.
- (b) When John's yellow shirt tore, he had to wear the brown one.
- (c) When John tore his yellow and his green shirt, his mother mended the yellow one.
- (d) \*When John's yellow shirt tore, he tried to mend the one.
- (e) When John's yellow shirt tore, he tried to mend it.
- (f) John has three books and I have four. (ones  $\Rightarrow \emptyset$ )
- (g) John bought three books and I read them. (ones  $\Rightarrow \emptyset$ )

Thus the only rules which would seem to be dependent on coreferentiality would be reflexivization (which in our system is just a marking of the head noun as [+Refl], the rest of the process being subsumed under the ordinary pronominalization rules) and definitization, which very few transformationalists have ever tried to formulate explicitly.

It therefore seemed possible to present a consistent system of rules without deep structure reference marking, with the understanding that if a reference marking system should be devised by someone else, it could be incorporated into our system just by making the reflexivization rule (and the definitization rule if there should be one) obligatory and dependent on the reference marking. The other rules would not be affected.

(2) One negative reason for taking the LK approach was that the Index approach runs into very complex problems with plural and quantified NP's. Thus for example no simple unitary referential index feature will account properly for the following:

- (44) (a) Every philosopher argues with himself.
- (b) Every philosopher argues with every philosopher.
- (45) (a) Only Lucifer pities himself.
- (b) Only Lucifer pities Lucifer.
- (46) (a) Most of the boys expect most of the boys to pass.
- (b) Most of the boys expect the boys to pass.
- (c) Most of the boys expect to pass.

- (47) (a) Three of the four boys were students and the other one was a cowboy.  
 (b) \*Three of the seven boys were students and the other one was a cowboy.

Thus we have the strong positive argument that, except for definitization, the rules involved in ordinary non-reflexive pronominalization do not appear to depend on reference anyway, combined with the negative argument that no one has been able to work out an adequate system of representing reference.

The consistency of our version of the LK approach depends on the claim that whenever we derive a pronoun transformationally, it can indeed be interpreted as anaphoric with respect to the noun or noun phrase which conditions the application of the rule. This follows from the fact that there must be some pronouns which are derived from the base (e.g. from underlying the one) to account for sentences which contain a pronoun but no possible antecedent ("he is sick"), and the fact that these pronouns should not have multiple derivations. That is, we must account for the following difference in possibility of anaphoric interpretation:

- (48) He is sick. (unambig. non-anaphoric)  
 (49) When the boy came in, he didn't say a word. (ambiguous)  
 (50) The boy saw himself in the mirror. (unambig. anaphoric)

With respect to the above examples, our rules have made the right predictions; the he of (48) could come only from deep structure the one, whereas the he of (49) had both that source and the boy as source; himself of (50) could come only from the boy.

However, there are other examples of the same sorts of judgments which cannot be handled by the system, as presented in the UESP (1967), PRO section. These examples and a discussion of their problems follow:

- (51) The boy saw him. (unambig. non-coref.)  
 (52) When three tall men came in Mary walked over to him.  
 (unambig. non-coref.)  
 (53) When he stood up, we all looked at another boy.  
 (unambig. non-coref.)

All of our problematical cases have in common the fact that sentences which involve unambiguously non-coreferential pronouns can be derived by our system in two ways, predicting the kind of ambiguity found in (49) above. The particular examples shown above have

undesired derivations from:

- (54) The boy saw the boy.
- (55) When three tall men came in Mary walked over to the man.
- (56) When the boy stood up, we all looked at another boy.

An obviously relevant fact is that in all such cases, we have an occurrence of the N in the same sentence with another noun phrase containing the same N but not to be taken as coreferential with it. If (contrary to fact) it were the case that non-coreferential noun phrases always had to have some formally different modifiers accompanying them, there would be no problem, because then non-coreferential NP's would never end up as personal pronouns. And (54) - (56) would probably be avoided in careful style in favor of something like:

- (57) This boy saw that boy. (or The former boy saw the latter boy; or any of a number of other circumlocutions)
- (58) When three tall men came in, Mary walked over to the man who was pretending to be asleep on the sofa.
- (59) When the first boy stood up, we all looked at a second boy.

Unfortunately, this is not an obligatory requirement. Not only do sentences like (54) - (56) occur quite commonly in a non-coreferential interpretation, but there is not even a unique "careful" form akin to (57) - (59); the language has a multiplicity of devices for indicating non-coreferentiality, but no single one which could be taken as basic and therefore used as formal basis for the appropriate rules.

The reason that occurrences of the N which are formally identical but not coreferential cause such problems for our analysis is that in our system, noun reduction to one depends only on noun identity, (which is basically correct - cf. (43.a-c)) but if there was nothing in the NP with the reduced noun except a definite article, the derivation will automatically continue and turn \*the one into him, it, etc. Thus, if the man occurs in the same sentence with another occurrence of man preceding it at the right point in the derivation, the grammar will always have the option of turning the man into him, thus implying coreferentiality with the preceding noun phrase containing man, even where this is in reality impossible as in (51) - (53).

On the one hand, these problems suggest that referential indexing might be necessary, and that semantically consistent pronominalization rules cannot be based on formal linguistic



structure (not including indices) alone. On the other hand, any system of referential indexing would itself have to be severely constrained by purely formal properties. Discussions of referential indexing in the literature have almost exclusively used in their examples proper nouns and NP's of the form the N. Typical examples would include (49), (50), (54), where the selection of same or different referent is indeed free. However, it is not clear what kind of system would indicate that the two NP's with men in (55) and the two with boy in (56) cannot be coreferential. It is clearly not simply the fact that they are formally distinct, since the underlined NP's can be coreferential in the following examples:

- (60) When the 5-year-old boy in a sailor suit had finished reciting his piece, everyone applauded loudly, and the naive little fellow really thought they meant it.

In addition to the problem of indicating when two NP's can be coreferential, there is a further problem in that in some cases, unlike (41), two formally identical definite NP's can only be understood as coreferential. (\*in the examples below means impossible if the references are distinct)

- (61) (a) \*John saw the man<sub>1</sub> but Bill didn't see the man<sub>2</sub>.  
 (b) \*The man<sub>1</sub> came in, but the man<sub>2</sub> left 5 minutes later.  
 (c) \*Everyone likes the new novel<sub>1</sub>, but no one has read the new novel<sub>2</sub>.

The following makes an interesting contrast:

- (62) [Preceding discourse: A man<sub>1</sub> and a woman<sub>1</sub> walked into a restaurant and noticed a man<sub>2</sub> and a woman<sub>2</sub> seated at a nearby table.]
- (a) The man<sub>1</sub> recognized the man<sub>2</sub> but the woman<sub>1</sub> didn't recognize the woman<sub>2</sub>.  
 (b) The man<sub>1</sub> recognized the woman<sub>2</sub>, but the woman<sub>1</sub> didn't recognize the man<sub>2</sub>.  
 (c) \*The man<sub>1</sub> recognized the woman<sub>2</sub>, but the man<sub>2</sub> didn't recognize the woman<sub>1</sub>.

It would appear that certain linguistic environments require a formal contrast between noncoreferential items while others do not. A case of the former, for instance, is "John saw \_\_\_ but Bill didn't see \_\_\_." Note that this is separate from the fact that but always requires some kind of contrast, since each of (61.a,b,c) becomes grammatical when the formally identical NP's are also coreferential and hence pronominalized. Other environments, such as "\_\_\_ recognized \_\_\_" do not require formal contrast between noncoreferential items.

The formal contrast required in the cases described above must be more than simple non-identity: each NP must in fact contain a modifier not present in the other.



- (63) (a) \*I liked the cat<sub>1</sub>, but John didn't like the fluffy cat<sub>2</sub>.  
 (b) \*Mary can solve the easy problems<sub>1</sub>, but John can't solve the problems<sub>2</sub>.

[NB the interesting locution "Mary can solve the easy problems, but John can't solve the problems period"]

- (c) \*John saw the program<sub>1</sub> that was on TV last Saturday and Bill saw the TV program<sub>2</sub>.

We see no obvious way of stating these constraints within any known syntactic framework. Within our system, the deletion of identical modifiers and reduction of the noun to one would have to be made obligatory for the starred examples of (61); within a reference-indexing system, the referential indices would have to be forced to be identical in just those cases. And in any system, the sentences of (63) must be excluded, since they cannot be interpreted either coreferentially or non-coreferentially. In any case, the conditioning environments do not appear to be syntactically characterizable.

The problems discussed so far amount to the following: English tolerates discrepancies between formal and referential identity of certain sorts in certain environments, not easily describable at all and particularly not describable in simple syntactic terms. Some of these discrepancies are not accounted for so far within any known framework, e.g. why the formally identical NP's of (62.a,b) can be non-coreferential while those of (61) cannot be, and why the sentences of (63) are impossible on any interpretation. But other discrepancies between formal and referential identity cause problems only for our analysis, and thus constitute a particularly serious challenge to the consistency of (our version, at least, of) the LK approach. The latter cases are all ones in which reduction of a repeated noun to one leads to false implications of coreferentiality, always because the reduced noun had a definite article and no remaining modifiers to prevent that NP from reducing all the way to a personal pronoun. There are several places one might try to pin the blame. (i) It might be an error to have noun-reduction to one as a step in the derivation of personal pronouns, i.e. the basic thesis of our treatment might be wrong. Certainly a retreat to the weaker position that there are entirely different rules involved in the derivation of personal pronouns, rules crucially referring to referential indices, would offer a solution. (ii) Perhaps the trouble lies with definitization, and what is needed is a formal distinction between deep structure definite articles and those derived transformationally, so that a noun immediately following a deep structure the could be disallowed from reducing to one. (iii) It could be that our rules are basically correct but that reference-marking is necessary in addition, so that a condition on noun-reduction to one might be either formal distinctness or coreference. This would of course destroy at least part of our main claim, namely the idea that only

definitization needs to refer explicitly to reference, the rest of pronominalization being purely formal.

However, there is a further problem which appears to be closely connected with those just discussed but which does not involve coreferentiality or the lack of it, as all the earlier problematical examples do. This would presumably be a problem in any analysis. Namely, in all of the following examples, the two NP's are interpretable in their non-reduced forms as non-coreferential, and yet reduction of the noun in the second to one is impossible even though it would not lead to a personal pronoun and hence would not lead to a false prediction of coreference.

- (64) (a) The man hit the man (~~⇒~~ one) wearing an overcoat.
- (b) A man hit a man (~~⇒~~ one) wearing an overcoat.
- (c) A man wearing an overcoat hit a man (~~⇒~~ one).

This is a problem in stating the environment for noun-reduction to one which is totally independent of coreferentiality, yet it is closely related to the coreferentiality problem because in the parallel example (65), allowing man  $\Rightarrow$  one would lead to an erroneous prediction of coreferentiality.

- (65) The man wearing an overcoat hit the man (~~⇒~~ one).

It would obviously be desirable to relate the two conditions under which  $N \Rightarrow \text{one}$ , namely the case of contrast and the case of full identity (where the NP eventually ends up as a personal pronoun). This was in fact one of the most attractive features of our approach, which postulated that in fact  $N \Rightarrow \text{one}$  was always permitted under conditions of formal noun identity: the problem now is to exclude just those cases where the NP's are noncoreferential but are not formally distinguished by having at least one non-shared modifier apiece.

An intuitive notion which would appear to capture the desired generalization is that of two NP's belonging to the same set in some "relevant" sense: e.g. "the man in shirt sleeves" and "the man wearing an overcoat"; "a blue pencil" and "a red pencil"; and as a special case, "John<sub>1</sub>" and "John<sub>1</sub>" - i.e., identical NP's are always in the same relevant set no matter how that set may be described.

Thus the environments discussed above which require non-coreferential NP's to be formally distinct (but which allow coreferential NP's to occur) might best be characterized as those which require NP's in them to belong to the "same 'relevant' set" in this informal sense. This seems in fact to be the same concept

that is involved in the odd cases of conjunction discussed in CONJ, such as:

- (66) (a) ? The men and tables were in the room.
- (b) ? John walks to school, but Bill brings his lunch.
- (c) ? Mary has a red dress, but Susan is afraid  
            of spiders.
- (d) ? Mary has a long black skirt and two new ones.

(Note that the notion of 'relevant set' is not confined to NP's in these examples.) There seems little likelihood of finding any syntactic characterization of what 'same relevant set' might mean.

It seems, then, that our attempt to push the LK approach to pronominalization to its limits, while not entirely successful, has uncovered some interesting and non-trivial problems which have counterparts in the referential indexing approach. Solution to these problems does not appear imminent, since the conditions do not appear to be syntactic in any familiar sense of the word. The rules presented in part III reflect the inadequacies of the LK approach as described above, but make the right predictions in enough cases that we considered it worthwhile to include them.

The following discussion of problems of modifier deletion and of definitization overlap in part with what immediately precedes, but contains more detailed observations on a number of points.

## 2. Modifier Deletion

Gleitman appeared to assume that only modifiers contiguous to the head noun could be deleted, but this is not a matter of general agreement. It appears to be the case that pronominalization resulting in a surface structure one can lead to considerable ambiguity. With one, the noun identity is usually clear:

- (67) I have a little red pencil and he has a blue one.

Ambiguity usually arises as to how complete identity is; that is, since the second NP may have modifiers which are not present in the first NP, and since these non-identical modifiers will remain after identical modifiers have been deleted and the noun node reduced to one it is not always (if ever) completely clear what modifiers are understood to have been present in the underlying structure before pronominalization operated. A modifier present in the first occurrence of the NP may be missing from the pronominalization of the second occurrence for either of two reasons: (i) it never was present (ii) it was present in the underlying structure and has been deleted under pronominalization. In (67) even though

little is not contiguous with pencil, it is to many people ambiguous as to whether one has deleted little ... pencil or just pencil. If the adjectives are moved out of their normal order, the resulting sentence is not so ambiguous:

(68) I have a red little pencil and he has a blue one.

Here most people feel that one replaces little pencil, but the interpretation that one replaces only pencil is still a possibility, though a less likely one. It is not at all clear whether this is because little and pencil are contiguous, or whether the change of order suggests that the modifiers are stacked or that little pencil is a compound. Any one of these explanations seems possible, and perhaps all these factors affect the interpretation. For instance, given:

(69) I have a little red pencil and he has a big one.

most people interpret one as replacing red pencil. Here, only contiguity can be a factor, since the order of the adjectives is normal. For most people, there seems to be degrees of ambiguity. Given the sequence:

(70) I saw a little <sup>/</sup>fat man and you saw a <sup>/</sup>thin one.

(71) I saw a <sup>/</sup>little fat man and you saw a <sup>/</sup>tall one.

(72) I saw a <sup>/</sup>fat little man and you saw a <sup>/</sup>thin one.

(73) ?I saw a fat <sup>/</sup>little man and you saw a <sup>/</sup>tall one.

(70) is considered the most ambiguous and (72) the least, with (71) in between. (73) is just considered peculiar, as perhaps a rather odd variant of (71). Here, the presence and absence of strong contrastive stress, the contiguity on non-contiguity of deleted modifiers in the NP and the order of modifiers all play a part. With stress, the listener is more likely to assume that, in (70), one = little ... man, but the possibility that one = man only is not excluded. When the modifiers are relative clauses, the question becomes even more difficult and the reactions of informants more diverse. There seems to be great disagreement as to the data:

(74) He read a book by James which was long, and I read one too.

(75) He read a book by James which was long and I read one which was short.

(76) He read a book by James that was long, and I read another.



(77) He read a book by James that was long, and I read one by Melville.

(78) He read a book by James which was long, and I read one by him too.

The general interpretation seems to be that when one is followed by a relative clause, one replaces the first occurrence of the noun and any relative clause except the last, which is understood to be in contrast with the new relative clause following one. That is, in (75) above, one replaces a book by James; in (74) and (76) where one is not followed by a relative clause, it is for most people ambiguous as to whether one replaces just a book by James or whether it replaces a book by James which was long. Here again, as in little ... pencil, contiguity of noun and modifier seems to play a role in interpretation.

If some people can delete non-contiguous modifiers, (and the reaction of some informants seems to indicate that this is indeed so), then the deletion transformation will be very hard to state. Further, there is the problem of where to draw the line. Consider:

(79) She brought a short thin red hexagonal pencil and I bought a long blue one.

(80) She bought a short thin red hexagonal pencil and I bought a fat round one.

It seems highly improbable that one could get the interpretation that one = thin ... hexagonal pencil in (79) and that in (80) one = short ... red ... pencil.

The whole matter is bound up with questions of contrastive stress, stacked vs. non-stacked restrictive modifiers, and also with conjunction, since many occurrences of one (as noted by Gleitman) occur with conjunction, and conjunction, which we assume precedes pronominalization, can also delete identical elements. To a sentence of this kind without conjunction, the reaction of some informants is that one deleted only the noun dress.

(81) After looking at several red woolen dresses with long sleeves my aunt decided that she would buy a nylon one.

We are restricting deletion to contiguous modifiers; however, we realize that there is disagreement as to the actual data here. This may be because in pronominalization with one enough of the structure is deleted that the derived tree is the same whether

identical modifiers have been deleted from the second occurrence of the NP, or were never there in the underlying structure. Since complete identity of the NP is not required, and since one may pronominalize varying amounts of the NP with one, in fact any amount up to but not including the article, this is perhaps not surprising. It may be the case that reordering of modifiers after deletion is permitted, and that the kind and extent of reordering varies with different grammars.

Ross (1967c) has also commented on the ambiguity resulting from pronominalization with one, noting that in some cases the ambiguity requires that, if pronominalization is restricted to constituents, then the order of adjectives in one of the input strings must be one which would be unacceptable in surface structure, as in:

- (82) (a) \*James bought a brick wonderful old house and  
I bought a wooden wonderful old house.
- (b) James bought a wonderful old brick house and  
I bought a wooden one.

where one replaces wonderful old house. Ross notes that this seems to require some sort of stylistic component, since the present theory will not handle this kind of problem. If we assume that deletion is restricted to constituents, then the deletion transformation is easier to state--but we have merely shifted the problem into other areas: (a) are there any restraints on the order in which modifiers are generated, or is this completely free? (b) what are the surface constraints on reordering after deletion? (c) how do we state the reordering transformation, particularly if underlying order is completely free?

There is a further problem when the total NP is reduced to one, in that to many people the resulting sentence has no ambiguity, and one is considered an NP containing all the modifiers present in the first occurrence of the NP, as in:

- (83) Tim bought a green 1967 R69-S with an Avon fairing  
and aluminum saddle-bags, and I want one too.

This interpretation agrees with Poutsma's, who notes that when not a prop-word, one "represents a preceding noun with all its modifiers, and may be considered as the absolute form of the indefinite article." Under our analysis, a sentence such as (83) would be multiply ambiguous, but it is by no means clear that this is indeed so. However, as noted above most people find (74) and (76) ambiguous.



However, far more serious problems exist with the deletion of modifiers in definite noun phrases. Where the pronominalized NP has a modifier not present in the pronominalizing NP, so that one is not deleted, the same ambiguity is present as noted above, as, for example, in:

- (84) After getting reacquainted with all the men in her distant past she finally decided to marry the one with the black patch (anyway).

Here, one = man or man in her distant past. However, when the pronominalization of a definite NP results in a personal pronoun, then there is no ambiguity at all; the pronoun is understood to replace a noun with all the modifiers present in the pronominalizing NP, as in: (and note the similarity with some people's reaction to one with no modifiers, as noted above):

- (85) (a) When a tall, thin, ugly man wearing a brown suit and a blue shirt and leading three Irish wolfhounds on a red leash walked into the restaurant, we all looked at him.

Here, if him and man are coreferential, then we understand the NP underlying him to have all the modifiers preceding man. Yet our rule would also reduce the underlying deep structure NP  $\Rightarrow$  the one  $\Rightarrow$  him, if instead the second NP had as its input to the pronominalization rules:

- (b) ...the tall man...
- (c) ...the tall thin man...
- (d) ...the thin man...
- (e) ...the thin ugly man...

or any NP with a subset of the modifiers in the first NP. In each case, the modifier(s) and man would be deleted, and replaced by one. This would predict a multiply ambiguous derivation for him, which is clearly wrong. We cannot restrict deletion of modifiers with definite NP's to the case when both NP's are completely identical (except for the determiner), since we want an ambiguous derivation for (84) and similar examples.

An alternate solution might seem to lie in the fact that there exists a synonymous variant of (85.a), namely:

- (85) (f) When a tall thin, ugly man wearing a brown suit and a blue shirt and leading three Irish wolfhounds on a red leash walked into the restaurant, we all looked at the man.

That is, the anaphoric replacement for the first NP can be either the N or a personal pronoun. In either case the interpretation is

one of complete identity, and there is no ambiguity. We could therefore consider deriving anaphoric third person pronouns only from the N, and not allow deletion of modifiers in definite NP's. The assumption would then be that identical modifiers had been deleted under definitization; (discussion of the deep structure of the man will be deferred until later). But this would again prevent us from deriving (84). It seems clear that we must allow noun node reduction to delete identical modifiers in definite NP's, but that we must allow it only when this will result in a surface structure with one, not in a personal pronoun. One suggestion therefore is to state a condition on noun node reduction to the effect that if the determiner in the second NP is definite, then pre- or post-nominal modifiers can be deleted only if the second NP contains at least one modifier not present in the first NP. The ad hoc nature of this condition, and the difficulty of stating it formally, are sufficiently obvious not to need further comment. We may note in passing that although we will thus block ambiguous derivations for personal pronouns, we will also derive some rather peculiar sentences, such as:

- (86) When a tall thin ugly man walked into the restaurant we all looked at the tall thin man.

Here, the second NP cannot be coreferential, since otherwise the second occurrence of man would need the modifier ugly also. (It is possible to repeat the second of two coreferential NP's with a subset of the modifiers present in the first occurrence, but only when there is an intervening non-coreferential NP, as in:

- (87) When a tall thin ugly man and a short plump attractive one walked into the restaurant, we all looked at the tall thin man.)

It would seem that the oddness of (86) is caused not by any constraint of pronominalization, but that it is semantically anomalous, or at least unlikely. But there seems no obvious syntactic fault in it.

An obvious advantage of deriving third person pronouns from the N with no modifiers is that by so doing we avoid the problem of an infinite deep structure for such sentences (attributed to Bach, though we have not found a written source) as:

- (88) The boy who loved her kissed the girl who hated him.

The suggested analysis would simply require the girl underlying her and the boy underlying him.

But such a solution would leave unsolved many of the related problems of reduction to one discussed in the preceding section, particularly those connected with examples (54) - (56).

## 3. Problems of Definitization

Before discussing the problems connected with viewing definitization as a rule, we must distinguish three types of occurrences of the definite article: (1) sententially anaphoric, (2) definite description with restrictive modifier, and (3) extra-sententially or extra-linguistically uniquely specified. (See DET for some further discussion.) A few typical examples of each type are:

- Type (1) (89) (a) Once there was a king and the king had a daughter.  
 (b) Some boys and girls came in, and the boys were all drunk.
- Type (2) (c) The boy you met is a botanist.  
 (d) I didn't see the book I needed.
- Type (3) (e) The telephone is ringing.  
 (f) The world is round.  
 (g) The boy sat down.

We are concerned here with type (1), but will need to mention the others occasionally.

It was stated above that we could assume personal pronouns to be derived from NP's of the form the N, and discussion of the deep structure of the N was deferred. In these cases, the is clearly anaphoric, and the assumption was, except for the tentative hypothesis advanced at the end of the preceding section, that the deep structure of the second NP had all the modifiers present in the first NP, but that these had been deleted under definitization. At first glance it would seem possible to write a rule for this process, and in fact Kuroda (1966b) has a rule for definitization (the process is also suggested by Postal, (1966b), who, however, has no rule, and who notes that the conditions under which it would operate are as yet not fully understood). Kuroda's rule is:

$$(90) \quad N_1 \text{ X Det } N_2 \Rightarrow N_1 \text{ X THAT } N_2 \quad [25]$$

$$\text{If } N_1 = N_2$$

Kuroda does not discuss modifier deletion, and if the NP's are not fully identical, then definitization will not occur and the modifiers will not be deleted. If we incorporate this rule, then we will obviate the need for these NP's to be definite in the deep structure, and, as stated above, we would prefer that determiners be indefinite in the deep structure and that definite articles be derived transformationally. However, there are a great many NP's which cannot be definitized this way. First, there are e.g. the sun, the moon, which are usually definite, and such sentences as:

(91) Where's the dog?

(92) Did the plumber come?

which are anaphoric but in which the definitization is extra-linguistic, i.e. type (3) above. Secondly, we have the very large class of definite NP's with restrictive modifiers, i.e. type (2), such as:

(93) The book he bought yesterday was damaged.

Vendler would consider this related to anaphoric definitization, both instances being examples of the definition of singular terms. In the case of (93), the restrictive modifier is not redundant (since it occurs nowhere else in the linguistic context) and cannot be omitted. In (85.f) (repeated below) the modifiers on the man are omitted precisely because they have occurred already and are redundant. However, in Vendler's analysis the deep structure of the second NP would be as in (85.g).

(85) (f) When a tall, thin, ugly man wearing a brown suit and a blue shirt and leading three Irish wolf-hounds on a red leash walked into the restaurant, we all looked at the man.

(85) (g) ..., we all looked at the man who walked into the restaurant.

which would pose further problems of derivation, i.e. the second NP of two coreferential NP's necessarily has one modifier not present in the first, namely, a repeat of the proposition in which the NP initially occurred. Robbins (1962, 1963) proposed to derive NP's as in (93) by an optional definitization rule triggered by the configuration Det N S; since she was not working within a Katz-Postal framework, this was sufficient for her purpose. We would not wish to adopt this, since there is clearly a difference in meaning between:

(94) (a) She showed me some puppies and I bought the long-haired one.

(b) She showed me some puppies and I bought the long-haired ones.

and

(94) (c) She showed me some puppies and I bought a long-haired one.

(d) She showed me some puppies and I bought some long-haired ones.

In (94.a) the implication is clearly that there was only one long-haired puppy shown, or, rather, in the relevant set; it is really



irrelevant whether or not the puppy bought is from the set shown or is in fact a puppy seen somewhere else; in either case, there is only one of this kind. Similarly, in (94.b) the claim is that the total set of long-haired puppies was bought. In these sentences, definitization seems to be a matter not of anaphora or of uniqueness, but of co-extensiveness with a set which is specified nowhere in the surface structure, i.e. in this case, the set of long-haired puppies. In (94.c) it may or may not be the case that only one puppy has long hair; in (94.d) the number of long-haired puppies bought could be less than the total set or equal to it. The indefinite article simply indicates that the property of coextensiveness is unspecified. It is difficult to suggest different deep structures for these sentences which would offer any explanation for the interpretation. Presumably one could make use of a feature such as [<sup>+</sup> Totality], but this would appear to be a device rather than an explanation.

As a further problem, we note that, unlike pronominalization, definitization would have to be constrained to work left-to-right only, since:

(95) (a) When the boy<sub>1</sub> came in I spoke to a boy<sub>2</sub>.

is anomalous if boy<sub>1</sub> is coreferential with boy<sub>2</sub>. A further complication is that for some people, if the indefinite NP has a restrictive modifier, then definitization can go backwards, as in:

(95) (b) When the boy<sub>1</sub> came in I spoke to a boy<sub>1</sub> who had won the prize.

A problem within the referential index framework is that if any definite articles at all are generated in deep structure (as they appear to have to be for type 2 and 3 cases), then sentences like (96) will be generated unless some constraint can be found which will block them.

(96) When a tall thin boy<sub>1</sub> came in I spoke to the little fat boy<sub>1</sub>.

In our grammar, we have had to assume that the definite/indefinite choice is made entirely at the deep structure level, since the problems connected with definitization by rule are so complex. This way out obviously just pushes the problems onto the semantic component, and may in fact be contributing to some of the syntactic problems of section II.C.1. This area is one which obviously needs (and is now beginning to receive) drastic rethinking of the whole semantic-syntactic framework.

D. General Problems of Pronominalization (i.e. not specifically of this analysis)

1. Backwards Pronominalization

Kuroda (1966b) seems to have been the first to note that under certain circumstances pronominalization can work backwards, as in:

(97) (a) When he came in the boy kissed Mary.

He also noted that pronominalization cannot work backwards when the (following) antecedent is indefinite, as in:

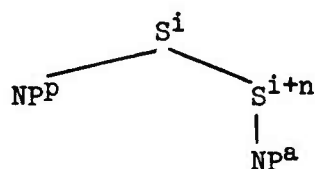
(97) (b) When he came in a boy kissed Mary.

(97.b) is grammatical providing that he and a boy are not coreferential. [This constraint would appear to be explained by the fact that (noted above) definitization cannot occur backwards (cf. (95.a)). If the NP can be definitized, then it can be pronominalized. This connection was not noticed by Kuroda.] The phenomenon of backwards pronominalization of definite NP's was further explored by Langacker, who formulated the constraint as follows:

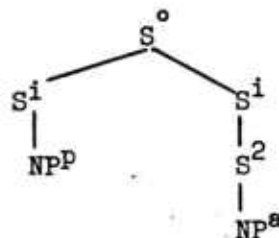
$NP^a$  may be used to pronominalize  $NP^p$  unless (1)  $NP^p$  precedes  $NP^a$ ; and (2) either (a)  $NP^p$  commands  $NP^a$ , or (b)  $NP^a$  and  $NP^p$  are elements of separate conjoined structures.

The notion of command was defined as follows:

...a node A "commands" another node B if (1) A does not dominate B; (2) B does not dominate A; (3) A is in structure  $S^i$ ; and (4) node  $S^i$  dominates B.



PM 8



PM 9

In PM8,  $NP^p$  is in the structure  $S^i$  and  $S^i$  dominates  $NP^a$ ; therefore  $NP^p$  commands  $NP^a$ . In PM9, the leftmost node  $S^i$  does not dominate  $NP^a$ , therefore  $NP^p$  does not command  $NP^a$ .

Langacker further noted that passivization must precede pronominalization; otherwise, one could not derive:



- (98) The mosquito which bit Algernon was killed by him. [52]

without also deriving:

- (99) \*He killed the mosquito which bit Algernon. [50]

Similarly, adverb preposing must precede pronominalization, in order to allow:

- (100) While Algernon wasn't looking, Penelope bit him in the leg.

and yet disallow:

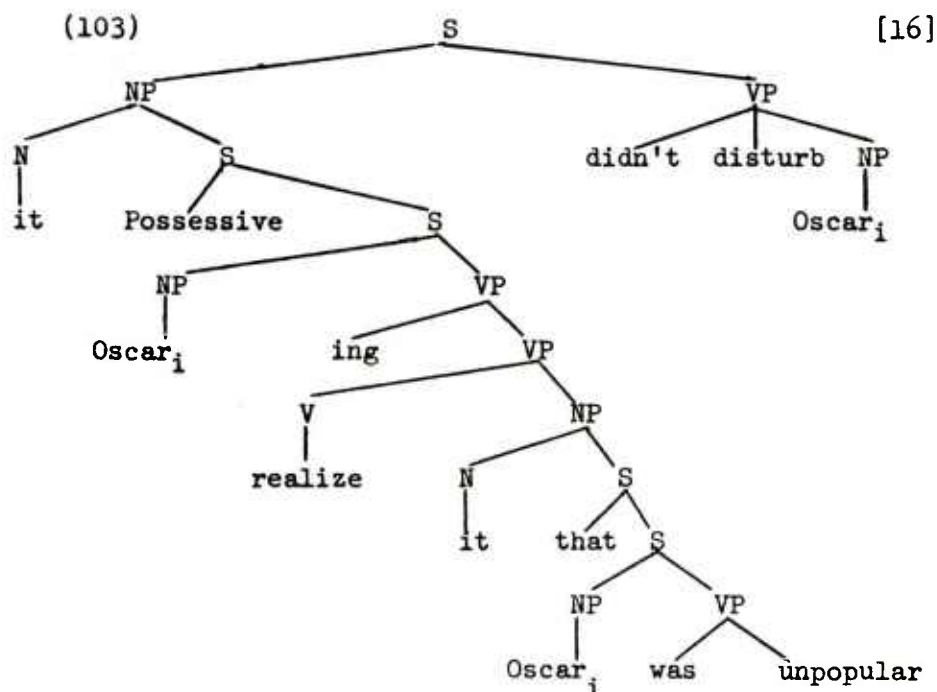
- (101) \*Penelope bit him in the leg while Algernon wasn't looking.

with him and Algernon coreferential.

Ross (1969) further developed this concept, and found in it support for the notion of the cycle in transformational theory. There are certain surface structures in which forwards pronominalization seems not to be allowed, as in:

- (102) \*Realizing that Oscar<sub>i</sub> was unpopular didn't disturb him<sub>i</sub>. [14b]

Ross assigns to this the (simplified) intermediate structure:



Pronominalization will of course not apply on the first cycle, since the structure being operated on is Oscar<sub>i</sub> was unpopular, which does not contain two coreferential NP's. However, later pronominalization will apply to:

(104) (a) Oscar<sub>i</sub> realized that Oscar<sub>i</sub> was unpopular. [19]

and this must operate forwards to produce:

(104) (b) Oscar<sub>i</sub> realized that he<sub>i</sub> was unpopular. [20.a]

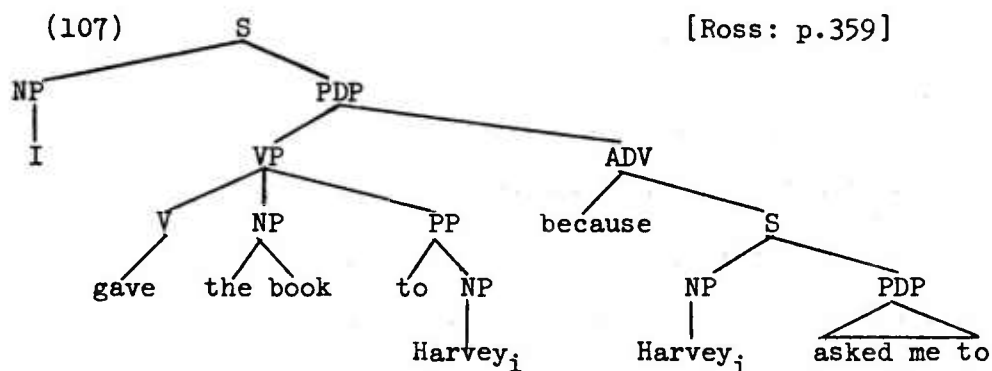
Backwards pronominalization cannot apply here, since the first occurrence of Oscar is not in a subordinate clause. When the highest cycle is reached, the structure is:

(105) Oscar's<sub>i</sub> realizing that he<sub>i</sub> was unpopular didn't disturb<sub>i</sub> Oscar<sub>i</sub>. [21]

and the first occurrence of Oscar will be deleted by Equi-NP deletion. (102) could be derived only by allowing backwards pronominalization to apply to (104.a), but, as noted above, this is excluded by the condition on backwards pronominalization. Thus a surface structure which seems to be an ungrammatical instance of forwards pronominalization is shown to be excluded by the interaction between the constraints on backwards pronominalization and the transformational cycle. However, Ross (1967c) gives some reasons why the constraint on backwards pronominalization cannot be stated in terms of the notion of "command": (1) Langacker is forced to derive:

(106) I gave the book to Harvey<sub>i</sub> because he<sub>i</sub> asked me to. [R:5.154a; L:72]

from the counter-intuitive intermediate structure:



in order to block:

(108) \*I gave the book to him<sub>i</sub> because Harvey<sub>i</sub> asked me to. [R:5.154b; L:73]

(2) because of the nature of the underlying configuration he has to assume, Langacker is further forced to formulate a rule to extrapose around the VP rather than round a variable to the end of the sentence. Because of this, he prevents himself from deriving:

- (109) (a) I figured it out that she was lying. [5.159a]  
 (b) I took it for granted that she was lying. [5.159c]

without a special rule for such sentences. Ross wishes to formulate the constraint as follows:

If one element precedes another, the second can only pronominalize the first if the first is dominated by a subordinate clause which does not dominate the second.

Ross notes that the notion "subordinate clause" needs further definition, and that it is possible that this may be language-specific rather than universal.

More recently, Lakoff (1968b) has seriously questioned both the data and the theory of backwards pronominalization. First, he claims that there are constraints on forwards pronominalization which cannot be explained by allowing all forwards pronominalization at a deeper level and constraining only backwards pronominalization. He suggests that some constraints must be stated as output conditions, and also that pronominalization is not cyclic (and further, that there is no evidence, once pronominalization is shown not to be cyclic, for a cycle at all). He concludes that there are two types of constraints on pronominalization, transformational conditions and output conditions. He cites Postal as claiming two rules of Adverb Preposing, one of which, Adverb Preposing<sub>2</sub>, follows pronominalization to derive:

- (110) (a) Near him, John saw a snake. [9]

from:

- (b) John saw a snake near him. [7]

while blocking (as coreferential)

- (c)\*Near John, he saw a snake. [10]

However, Lakoff gives sentences which cannot be derived by either Adverb Preposing<sub>1</sub>, or Adverb Preposing<sub>2</sub>, such as:

- (111) In his apartment, where Mary stays, John gives her pot to smoke. [24]

If (111) is derived by Adverb Preposing<sub>1</sub>, then her cannot be derived by forwards pronominalization; if (111) is derived by Adverb Preposing<sub>2</sub>, then her still can't be accounted for since to get it backwards pronominalization would have to apply incorrectly, as in:

(112) \*John gives her pot to smoke, in his apartment,  
where Mary stays. [20]

Further, if (111) is derived by Adverb Preposing<sub>1</sub>, then his can't be accounted for, since again backwards pronominalization would have had to apply incorrectly. He concludes on the basis of other sentences that there is only one rule of Adverb Preposing, that it should precede pronominalization, that the scope of backwards pronominalization should be extended to allow:

(113) In his apartment, John smokes pot. [13]

and that forwards pronominalization must be restricted. He further notes that there appears to be a subject/non-subject division in pronominalization; specifically, pronominalization can go forwards from a non-clausal preposed adverb to a non-subject, but not to a subject, and pronominalization can go backwards from a subject into a non-clausal preposed adverb but not from a non-subject. Also, pronominalization can go backwards out of a subordinate clause to non-subjects of main clauses but not to subjects of main clauses. Therefore, he concludes that regardless of rule ordering, forwards pronominalization must be blocked in some environments, and that the subject/non-subject division must be taken into account when stating the conditions under which pronominalization can occur. He also investigates Topicalization and Cleft sentences with similar results; namely that there is no simple rule-ordered solution, and that pronominalization must follow rather than be both preceded and followed by Adverb Preposing, Topicalization, and Cleft sentence formation. He claims that no rules can follow pronominalization, and that this "... is a necessary fact ... about the nature of anaphoric processes in language, not a fact about one rule in English". He notes that "possible pronoun-antecedent relations are in part determined by a phonetic stress rule" which is itself determined by such factors as the length of the sentence and in particular of the VP, and that such a rule would apply after all syntactic and phonological rules had applied. For this reason, some constraints on pronoun/antecedent pairs must, he feels, be stated as output conditions. He concludes that the theory of output conditions will have to include: (i) variables, (ii) a definition of main clause and subordinate clause (iii) a definition of subject and non-subject (iv) a specification of phonetic stress level (v) a means of indicating identity of intended reference (vi) the notion of command (vii) a limited use of quantifiers. He suggests the following output condition for sentences with preposed adverbs

or topicalization:

(114) Structural description [116]

X	-	NP	-	X	-	NP	-	X
1		2		3		4		5

The sentence is unacceptable if:

- (a) 2 has the same reference as 4 and
- (b) 2 commands 4 and
- (c) 4 = [+PRO] and [-REL] and
- (d) 2 is above the appropriate stress level and
- (e) 4 is a subject and
- (f) there is at most one S node which dominates 4 but does not dominate 2.

He investigates the possibility of formulating a notion of prominence, since preposed adverbs, topicalization and clefted elements are all being given focus, but concludes that this would merely add a new device without getting rid of any old ones.

Lakoff extends his discussion of pronominalization constraints to suggest a hierarchy of anaphoric expressions:

- |       |                          |       |
|-------|--------------------------|-------|
| (115) | 1. proper names          | [134] |
|       | 2. definite descriptions |       |
|       | 3. epithets              |       |
|       | 4. pronouns              |       |

and claims that an NP with a lower number can be an antecedent of an NP with a higher number, but not vice versa.

Lakoff seems to have shown quite convincingly that constraints on the direction of pronominalization cannot be formulated as proposed by Ross and Langacker. We have therefore not attempted to incorporate Ross's conditions into our pronominalization rule.

It should be noted that pronominalization with one can apply backwards, as in:

- (116) After everyone else had seen one John finally caught sight of a nightingale.
- (117) Because I prefer the new one John always drives the old car.



This fact fits in with our treatment of pronominalization: since our derivation of personal pronouns includes reduction to one, the possibility of backwards pronominalization with personal pronouns follows from the possibility of backwards reduction to one. Ross (1967c) has pointed out that many kinds of Pro-ing other than of NP's can occur backwards, as in:

- (118) Although no one else believes it, Harry believes that Sally is innocent. [S Deletion: 6.167d]
- (119) After Henry had done it, Webster touched a sword. [S Deletion: 5.167d]
- (120) Although no one else thinks so, Harry thinks that Sally is innocent. [So Insertion: 5.169d]
- (121) After Henry had done so, Webster touched a sword. [do so as a special case of So Insertion: 5.170d]

Since we are restricting our analysis of pronominalization to NP's, we will not discuss this further than to agree with Ross that a fairly wide generalization seems to be involved here, which deserves further investigation.

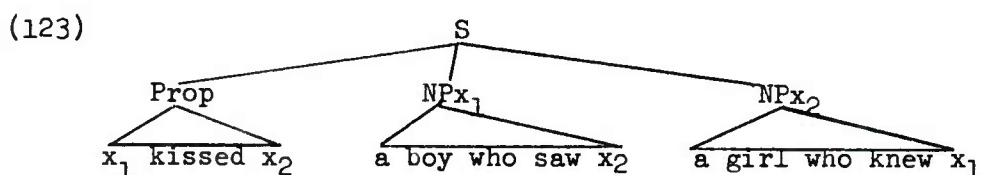
## 2. Problems of Identity

### (a) Formal

It was suggested above that the problem of specifying an infinite deep structure for (88) could be avoided by deriving personal pronouns from an underlying the N with no modifiers. McCawley (1967c) has suggested that a modified form of symbolic logic provides an appropriate deep structure for transformational grammars, and that one advantage of this system would be a solution to sentences such as (88) and (122):

- (122) A boy who saw her kissed a girl who knew him. [32]

McCawley would derive this from:



Under this theory, pronominalization would not be a matter of replacing repeated NP's with pronouns but rather of determining which occurrence of an index will have a fully-specified NP



substituted for it. Other occurrences of indices will be filled with pronouns. Using the constraints suggested by Ross (1968), given (123) one can get:

(124) A boy who saw  $x_2$  kissed  $x_2$ .

(125)  $x_1$  kissed a girl who knew  $x_1$ .

In (124) a full NP can be substituted for  $x_2$  in either position; in (125) the first occurrence of  $x_1$  must be replaced by a full NP. McCawley notes that one result is that this will allow two ways of deriving (122) from (123). A further disadvantage (from our point of view) is that this theory of pronominalization does not seem to allow for integrating the derivation of personal pronouns with pronominalization with one. Further, it seems possible that the problem of identity requiring an infinite deep structure might also crop up in deriving the relative clauses in  $NPx_1$  and  $NPx_2$ ; however, this is not clear, since McCawley does not touch on this point.

Jackendoff (1968a) has proposed solving this problem with an interpretive theory of pronominalization, in which pronouns are generated at random in the deep structure like any other NP, and coreferentiality is assigned by rules in the semantic component. His proposal seems to miss some generalizations, i.e. that only [+Pro] NP's have antecedents, and that whereas two pronouns can have the same antecedent, one pronoun cannot have two antecedents (except of course plural pronouns). It is not clear how Jackendoff would handle derivative they, we, as in:

(126) After John talked to  $\begin{Bmatrix} \text{Mary} \\ \text{me} \end{Bmatrix}$   $\begin{Bmatrix} \text{they} \\ \text{we} \end{Bmatrix}$  decided to go.

Further, in a derivational scheme of pronominalization the hierarchy of person can be clearly indicated: all feature complexes which include [+I] → 1st person, then complexes with [+II] → 2nd person, then [+III] → 3rd person. Apparently, Jackendoff's theory would not reveal this in any way. There is one advantage to Jackendoff's theory, in that he suggests it can be developed to include the anaphoric use of epithets, as in:

(127) Irving was besieged by a horde of bills that  
the poor guy couldn't pay. [86]

In our analysis of pronominalization, we have no proposal for handling anaphora of this kind, though it is possible that an

interpretive theory of definitization could perhaps be extended to cover this. It is not confined to epithets, as illustrated by:

- (128) When a little blond-haired boy ran into the room  
we all smiled at the child.

There appears to be no requirement of formal identity for anaphoric definitization. It does seem, however, that one must proceed from a more to a less specific NP:

- (129) \*When a little blond-haired child ran into the  
room we all smiled at the boy.

(with child and boy coreferential) is not so acceptable. This would seem to support Lakoff's idea of a hierarchy of anaphora.

Jackendoff makes the counterintuitive claim that sentences containing reflexive pronouns in impossible positions, e.g. as subject, count as syntactically well-formed and only semantically deviant. This is perhaps a special case of a more general problem with his approach, namely that deep structure lexical insertion and early transformations would somehow have to be constrained to apply as if the PRO element had all the features which will later be assigned to it by the interpretive rules. For example, if a certain occurrence of they is eventually going to be marked as coreferential with tables, it should be constrained all along to occur in an environment which would allow tables and to behave in all the T-rules just as tables would have behaved. It is not at all clear how this could be done without a great amount of blocking apparatus.

A proposal having some similarities both to McCawley (1967c) and to Jackendoff (1968a) is made in Karttunen (1967), although he was concerned with rather different problems, namely with the do-so type of sentence reduction across conjunction. In this proposal, NP's are marked in the deep structure for coreference. Only one of a set of coreferential NP's is fully-specified, the others being unexpanded terminal symbols. The semantic component then assigns all the features of the full NP's to the coreferential dummy symbols (and, presumably, a rule somewhere would insert a pronominal form). One obvious defect of the proposal is that it is always the topmost NP in a tree which is fully-specified; there is no allowance for backwards pronominalization or for any optionality. In this respect, therefore, it is less adequate than either of the two preceding proposals.

In general, any proposal which postulates a deep-structure

difference between an eventual antecedent NP and its eventual anaphoric replacements encounters the serious problem that it is impossible to specify in the deep structure which occurrence(s) can in fact serve as antecedent in the final sentence.

(b) Questions of Real-Word Reference

It has been proposed (e.g. Chomsky (1965)) that coreferentiality can be indicated by assigning indices to NP's. However, Postal (1967b) has pointed out that it is by no means clear what we mean by coreferentiality, since in many cases the two coreferential NP's do not refer to the same physical object, as in:

(130) The alligator's tail fell off but it grew back. [1]

and in:

(131) My home used to be in Baltimore but now it's  
in Los Angeles.

Karttunen (1968) has also noted that although one can perfectly well pronominalize fictitious objects, as in:

(132) I saw a unicorn. It had a gold mane. [4]

under certain conditions, such as when the first proposition is negated, then the NP cannot be pronominalized:

(133) I didn't see a unicorn. \*It had a gold mane. [4]

Similarly, he notes that one can say:

(134) I wish she had a car. She would give me a  
ride in it. [13]

but not:

(135) I wish she had a car. \*I will drive it. [9]

We have in our analysis assumed that an indefinite [+Specific] NP can be the antecedent, but not a [-Specific] indefinite NP (cf. DET for discussion of [+Specific]). However, a car in (134) certainly seems to be [-Specific]. The counterfactual mood appears to make the pronominalization acceptable. Lakoff (1968c) discusses this problem, extending it to include reference within a dream world or different worlds of belief. Karttunen and Lakoff suggest ways of representing their examples by means of (different) logical systems. However Lakoff himself points out that he has "no clear idea at present how to integrate such a notion into syntax."

### 3. Emphatic and "Picture" Reflexives

There are some exceptions to the rule that reflexivization occurs within a simple S. Hall (1965) noted the following exceptions:

- (136) (a) The only thing John talks to Mary about is himself. [3-10]
- (b) The only thing John talks to Mary about is herself. [3-11]
- (c) John's favorite topic of conversation is himself. [3-12]
- (d) Many of John's pictures are of himself.

She noted that the reflexive in these cases, unlike the typical reflexives, has main stress; in this respect it is like the appositive reflexives:

- (137) (a) John will wash the car himself. [3-14]
- (b) They took their petition to the President himself. [3-15]
- (c) I would stay away from them, myself. [3-16]
- (d) Oh, you've been to Tokyo? I've been there myself. [3-17]

She notes that, although all these uses are appositive, they cannot be paraphrased in the same way. Further, although it is usually true that an appositive -self pronoun can appear either immediately following the noun it repeats or at the end of the sentence, there are exceptions to this:

- (138) \*With proper tools, one oneself can assemble a bicycle. [3-24]
- (139) \*The President was implicated in the scandal himself. [3-25]

Her proposal (for which no exact rules are specified) is that these reflexives be derived as appositives, and that the preceding NP to which they are in apposition be deleted in certain cases. Ross (1968b) apparently assumes a similar derivation distinct from the conditions governing normal reflexivization. He also discusses the reflexive forms found after such nouns as picture, story, etc., as in:

- (140) Tad knew that it would be a story about himself. [33a]

but suggests no rule for deriving them, observing only that there may in fact be three distinct rules for reflexive pronouns. Jackendoff (1968a) noted that not only is "picture" reflexivization not restricted to occurring within a simple S, but that, contrary to normal reflexivization, it can occur backwards and even backwards in a higher S (contrary to the

normal constraints on backwards pronominalization).

- (141) The picture of himself that John saw hanging  
in the post office was ugly. [15]

However, instead of assuming that these reflexive pronouns perhaps require different rules from those discussed by Lees and Klima, Jackendoff proposes to develop his interpretive theory of reflexivization to include them (but not the emphatic appositive reflexives, which he does not discuss). To do this he incorporates Ross's constraints on backwards pronominalization into his interpretive theory, cycling on both NP's and S's (as we do). Some objections to Jackendoff's proposal in general have already been discussed. Note also that, although he intends to block sentences such as:

- (142) \*Himself saw John.

under his proposal this would merely be semantically anomalous.

Jackendoff also discusses the acceptability of reflexives in NP's with relative clauses, as in:

- (143) I hate the story about  $\left\{ \begin{array}{l} *him \\ *himself \\ me \\ *myself \end{array} \right\}$  that John  
always tells. [74]

- (144) I told the story about  $\left\{ \begin{array}{l} *him \\ *himself \\ *me \\ myself \end{array} \right\}$  that John  
likes to hear. [75]

He argues that there is an optional semantic rule preceding reflexivization which duplicates the subject of a sentence in the determiner of the object when the verb of the sentence is such that the subject is performing a direct action on the object. As supporting evidence he adduces:

- (145) (a) Today I shot my first lion. }  
(b) \*Today I was scared of my first lion. } [77]

But (145.a,b) support his paradigm only because of the particular properties of such phrases as my first N. True possessives indicating ownership do not behave in this way, as shown by:

- (146) (a) Yesterday I shot my dog.  
(b) Yesterday I was scared of my dog (but today he's scared of me).



Further, it is difficult to see how such a rule could be optional, or what the deep structure before insertion of the subject into the determiner of the object would be, since (146.a) clearly makes a different claim from either:

(146) (c) Yesterday I shot a dog.

or

(146) (d) Yesterday I shot the dog.

It would seem therefore that Jackendoff's rule (as stated) is not sufficiently accurate, and cannot be used as a basis for explaining (143) and (144).

Note that in (144) the replacement of the story by my story does not change the meaning. This suggests that perhaps the deep structure contained two occurrences of I, one of which has been deleted. If both occurrences could be analyzed as cases on a noun, then the operation of reflexivization on the NP cycle would account for these reflexives, as it does for those in the examples below:

- (147) (a) John's picture of himself
- (b) John's story about himself
- (c) The machine's destruction of itself

If more of the problematical cases could be analyzed as having the reflexives on a case phrase rather than a reduced relative, some of these problems might be on their way to a solution. However, many of them still appear intractable at this point.

We are restricting our analysis to reflexive pronouns within a simplex S or NP; we have at present no derivation for the other -self pronouns.

#### 4. The Pronominalization of Conjoined NP's

It was stated above that if an NP can be definitized, then it can be pronominalized. However, this statement does not always hold. The following sentence:

- (148) A woman walked into a restaurant carrying a little girl in one arm and a parcel in the other.

can be followed by:

- (149) (a) Suddenly she stumbled and dropped them.
- (b) Suddenly she stumbled and dropped both of them.
- (c) Suddenly she stumbled and dropped one of them.
- (d) Suddenly she stumbled and dropped the little girl.
- (e) Suddenly she stumbled and dropped the parcel.

However, it is ungrammatical to follow (148) with any of the following:



- (149) (f) \*Suddenly she stumbled and dropped her.
- (g) \*Suddenly she stumbled and dropped it.
- (h) \*Suddenly she stumbled and dropped both her  
and it.

although in all cases the pronominal form makes the reference perfectly clear. Yet, as shown by (149.d,e), the NP's can be definitized separately. We have no explanation to offer of this curious fact.

##### 5. Pronominalization in Manner and Time Adverbials

Kuroda (1967) cites the following as examples of sentences in which an NP can be definitized but not pronominalized by either a personal pronoun or one:

- (150) That was the manner of disappearing John described to Mary, and he actually disappeared in that manner. [95]
- (151) That was the day John told Mary he would disappear, and he actually disappeared on that day. [96]
- (152) \*That was the manner of disappearing John described to Mary, and he actually disappeared in it. [97]
- (153) \*That was the day John told Mary he would disappear, and he actually disappeared on it. [98]
- (154) \*That was the manner of disappearing John described to Mary, but he actually disappeared in some other one. [101]
- (155) \*That was the day John told Mary he would disappear, but he actually disappeared on some other one. [102]

However, it would seem that in these sentences the NP's are not definitized anaphorically, but, instead, that the definite determiner is dependent on the presence of a restrictive relative clause. Note that, in contrast with (150) and (151), we cannot have:

- (156) \*That was the manner of disappearing John described to Mary, and he actually disappeared in the manner.
- (157) \*That was the day John told Mary he would disappear, and he actually disappeared on the day.

A plausible derivation for that manner in (150) and that day in (151) is from an underlying structure such as the N S as suggested in Klima (1964). Sentences (156-7) seem to indicate that anaphoric definitization cannot occur in these adverbials, while sentences (154-5) indicate that pronominalization (specifically, reduction of the noun node to one) is blocked independently of definitization. Again, we have no explanation to offer for this constraint.

### III. THE DERIVATION OF PRONOMINAL FORMS

A. Reflexives (partly optional)

### Structure Index:

X NP [ DET [ART X] X N X] X NP [ DET [ART X] X N X] X  
 1 2 3 4 5 6 7 8 9 [ +DEF  
 [ -DEM  
 [ -GENERIC] 12 13 14 15  
 10 11

Conditions:

1. 2 immed. dom. by lowest S or NP that dom. 9
2. 6 immed. dom. by NOM, has no sister NOM, no right sister N (i.e. 6 is head N of its NP)
3. 13 is head N of its NP (as above)
4. 567 = 12 13 14
5. if 3 = [+DEF, -GENERIC], then 3 = 10 and 4 = 11  
if 3 ≠ 10, then 11 is null and 10 is [-I, -II]

Optionality: If 3 is [+I] or [+II], OBLIGATORY: otherwise OPTIONAL

**Structure Change:**

Add 

+Ref1
+Attach

 to 13 and to 10

Notes and Justification:

1. The rule is optional for all third person nouns and pronouns, reflecting the decision not to treat reference. Thus he saw him and he saw himself are generated as optional variants. The fact that a special condition is needed to make reflexivization obligatory for first and second persons is not simply a result of this decision, since \*we saw us is ungrammatical even when the reference is non-identical. See II.C.1 for a more detailed discussion.

2. Reflexivization must precede deletion of definite articles with proper nouns to get John saw himself, since the second NP must have a definite article at the time of reflexivization.

3. The feature [+Attach] is used in the article attachment rule (§ D); the same feature is used for someone, etc.

4. The identity condition is not on the total NP because of such sentences as:

- (158) (a) Every philosopher contradicts himself.  
 (b) Three boys hurt themselves.  
 (c) Each of the boys helped himself.  
 (d) No one contradicted himself.

Recoverability (non-ambiguity) is assured, however, since if the subject is definite the entire NP's must be identical, and if the subject is indefinite, the determiner of the second NP must consist only of a definite article and the rest of the NP must be identical. Thus (158.a-d) are derived from:

- (159) (a) Every philosopher contradicts the philosopher.  
 (b) Three boys hurt the boys.  
 (c) Each boy of the boys helped the boy of the boys.  
 (d) No one contradicted the (=he) one.

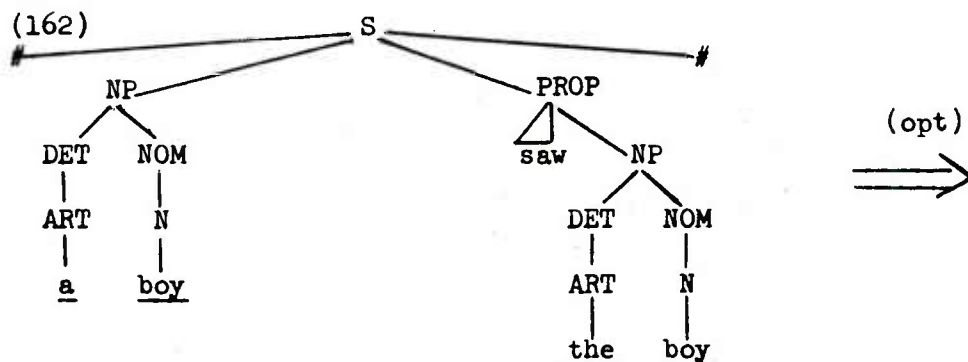
5. Reflexivization precedes conjunction. For justification of this claim and derivation of plural reflexives from conjoined reflexives, see the pronoun conjunction rule in D.4 below. This rule will generate:

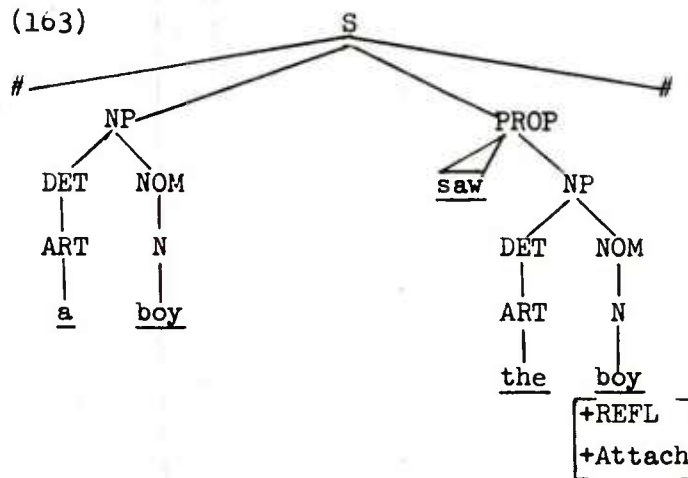
- (160) \*John and Mary bought a house for himself and herself.

which will obligatorily become, by the pronoun conjunction rule,

- (161) John and Mary bought a house for themselves.

Example in Tree Form:





### Examples

#### (a) Grammatical and generated

- (164) The boy saw himself. (from The boy saw the boy.)
- (165) A boy saw himself. (from A boy saw the boy.)
- (166) A boy in a blue suit saw himself. (from A boy in a blue suit saw the boy in a blue suit.)
- (167) John helped himself and I helped myself. (later becomes \*John and I helped himself and myself respectively. by the conjunction schema, then obligatorily by PRO-conjunction becomes John and I helped ourselves.)
- (168) John prefers himself to me and I prefer him to myself. (⇒ \*John and I prefer himself and him to me and myself respectively. ⇒ John and I prefer him to me. by PRO-conjunction)
- (169) \*John and Mary jointly bought a house for himself and herself (⇒ ...for themselves, by PRO-conjunction)
- (170) Everyone helped himself.
- (171) He has a picture of himself.

#### (b) Ungrammatical and disallowed

- (172) \*The boy saw herself. (The reflexivization rule does not itself delete the original noun stem; hence the feature copying rule, which comes later,

will copy the gender features from the noun onto the definite article, which later becomes him, her, etc.)

(173) \*You saw you, \*I saw me.

(174) \*Everyone helped themselves. (but see Dialect Variant below, examples (181-2).)

(c) Grammatical but not generated by this rule

(175) He pushed the pillow behind him. (unresolved problem)  
(Here, him = he, and both NP's are dominated by the same S, but for some reason we cannot explain REFLEXIVIZATION does not take place. This has also been noted by Chomsky (1965) pp. 146-7.)

(176) I myself saw him do it. (We have not handled intensifying reflexives.)

(177) He likes { his own self  
his pretty little self  
his own sweet self } best.

These cannot be generated by our rule since our rule requires identical modifiers between subject NP and the NP to be reflexivized, and all such modifiers are deleted by the rule. We have not tried to handle own.

These examples do not seem to involve simply a separate lexical item self, since they show the same restrictions on number and gender agreement with the subject as do ordinary reflexives.

(178) Everyone helped everyone. (the rule does not apply, since the second NP does not have a definite article)

(179) Politicians distrust politicians. (same comment)

(d) Ungrammatical but not excluded

- (180) (a) \*We saw me.
- (b) \*I saw us.
- (c) \*You (sg) saw you (pl).
- (d) \*We (incl) saw us (excl).

The rule is obligatory for first and second persons, but it will fail to apply when they are non-identical, and no provision has been made for blocking these cases.



Unresolved problems:

1. The one of One should never offer a Tiparillo to a lady will be discussed below; but we do not have any proposal for deriving the reflexive form oneself from it -- only himself.
2. Other unresolved problems are exemplified by examples (175-7) and (180) above.

Reflexivization: Dialect Variant

Same structure index and condition; but:

If 4 contains [+DIST(ributive)], replace [<sup>+</sup> Plural] in  
13 by [<sup>QUANT</sup> +Plural].

**Examples:**

- (181) Everyone saw themselves on TV.
- (182) No one watched themselves for very long.

### B. Rules Which Add Features to ART

## 1. ACCUSATIVE MARKING

## Structure Index:

$$X \left\{ \begin{array}{c} V \\ \text{PREP} \end{array} \right\} \text{ART} \quad X$$

$$1 \quad 2 \quad 3 \quad 4$$

### Structure Change:

Add [+Accus] to 3.

Examples:

- (a) Grammatical and generated

- (183) She gave the apple to him (to the one = to him)  
[+Accus]
- (184) He saw them.

- (b) Ungrammatical and excluded

- (185) \*Him and her gave the apple to John and I.

(c) Grammatical, generated by other rules

(186) John saw himself. (by Reflexivization in addition to this rule)

(d) Grammatical, not generated

(187) Give me them.

# Notes

1. This rule is a slightly modified version of Fillmore's T12 Case. Its order with respect to the following rule appears to be immaterial.

2. Sentence (187) is a problem because the second NP directly follows neither a V nor a PREP. The obvious solution of having this rule precede indirect-object movement wouldn't work in our grammar, since that rule is just part of object placement, which precedes subject placement, which clearly must precede ACCUSATIVE MARKING.

## 2. TRANSFER OF NOUN FEATURES TO ARTICLE

Structure Index:

X	NP	[ART	X	N	X]	X
1	2	3	4	6	7	

$\alpha$ Count $(\beta$ Human) $(\gamma$ Masc) $(\delta$ Plural)
---

5

Condition:

4 immed. dom. by NOM, has no sister NOM, and no right sister N (i.e. is head N of NP)

Structure Change:

Add the features 5 to 2

# Notes

1. Parentheses on features mean they may not appear on all nouns. However, in this case if they are present they must be transferred.

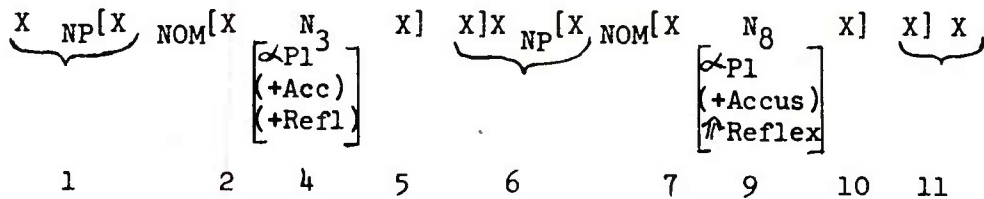
2. The listed features are those required to correctly distinguish who/which and the third person pronouns (articles). Note that person is an inherent feature of the determiner (we Americans - you Americans - the Americans) but gender and humanness inhere in the noun.

3. This rule is a modified version of Fillmore's T11 Feature Transfer.

### C. Pronominalization Proper

#### 1. REDUCTION OF NOUN NODE TO ONE

Structure Index:



Conditions:

2 = 7, 3 = 8, 5 = 10

OBLIG if  $\pi = +$ , OPT if  $\pi = -$ .

Structure Change:

(1) Add [+PRO] to 9 and substitute the result for 8.

(2) Delete 7 and 10

Notes:

1. For this rule to operate, it is necessary only for the phonological matrices and inherent features of the two nouns to be the same. Number, case, and the presence or absence of reflexivization are irrelevant.

2. The rule (1) inserts [+Pro] into the feature matrix specified at 9, deleting the phonological matrix of the noun and all of its syntactic features not specified in 9.

3. The rule (2) deletes all identical modifiers contiguous to the noun.

4. This rule will leave a prop-noun which, when  $\begin{bmatrix} +\text{Count} \\ -\text{Reflexive} \end{bmatrix}$  will rewrite as one (s), and when  $\begin{bmatrix} +\text{Count} \\ +\text{Reflexive} \end{bmatrix}$  as self/-ves;  $\begin{bmatrix} -\text{Count} \\ -\text{Plural} \end{bmatrix}$  will have a zero phonological form, and  $\begin{bmatrix} -\text{Count} \\ +\text{Plural} \end{bmatrix}$  cannot occur.

5. This rule does not allow for backwards pronominalization, which is possible even in indefinite NP's.

### Examples

#### (a) Allowed

- (188) Last week I made myself a dress with a long skirt for the Chancellor's party, and a woolen one for work. (one = dress)
- (189) Last week I made 2 dresses with long skirts and three with short ones. (ones = skirts)
- (190) Many students of the ones at UCLA have cars.
- (191) I thought of a bird and a one flew by ( $\Rightarrow$  and a flew by  $\Rightarrow$  and one flew by). One is a stressed variant of a, among other things.

#### (b) Ungrammatical but not disallowed by this rule as stated

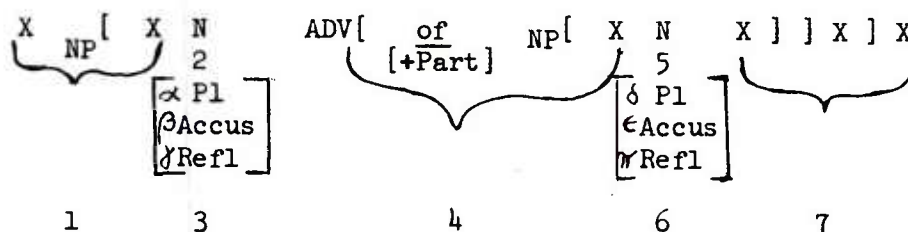
- (192) \*Last week I made myself a dress with a long skirt for the Chancellor's party, and I made a woolen one for work. (one = skirt)

#### (c) Grammatical, but not generated by this rule

- (193) I looked for a pen and found one in the desk. (one is not a rewrite on the N  $\begin{bmatrix} +\text{Pro} \end{bmatrix}$ , but is a stressed variant form of the indefinite article a; after the application of this rule, we would have ... found a one in the desk)
- (194) Because the red one was damaged, I bought the blue dress. (see Note 5)
- (195) After everyone else had seen one, John finally saw a Western tanager too.

## 2. REDUCTION OF NOUN NODE WITH PARTITIVES (obligatory)

Structure Index:



Conditions:

2 = 5 (i.e., identical in all features except number, case, and reflexive)

Structure Change:

Add [+PRO] to 3 and substitute the result for 2.

### Notes

1. There does not seem to be any reasonable way of combining the backward noun reduction of many of the boys with the usual forward noun reduction, unfortunately.

Example in Tree Form: See DET, derivation of many of the boys.

Examples:

(a) Allowed

(196) John met many ones of the boys. (ones will be deleted by the following rule)

(197) John met many tall ones of the boys. (ones will not be deleted)

(198) John met many ones of the tall ones of the boys.

(b) Grammatical, but not generated by this rule:

(199) John met one of the boys. (This rule gives one one of the boys, next rule deletes prop-noun)

(c) Ungrammatical, excluded by this rule.

(200) John met many boys of the boys.

Justification: see DET report

#### Unresolved Problems:

1. If "many tall boys of the boys" is as acceptable as "many tall ones of the boys", then the rule should be made optional in case there is a modifier on the first N; this has not been done.

3. DELETION OF NOUN NODE (obligatory)

#### Structure Index:

X	NP[	DET[	X	[+N DEL]	$\alpha$ Pl	X	]	X
					$\beta$ Count			
					+Pro			
					-Refl			
1		2	3	N	4	5	6	

#### Condition:

If  $\alpha$  is - and  $\beta$  is + and 3 is  $\begin{bmatrix} +Def \\ -Dem \end{bmatrix}$ , then 5 is null.

(I.e. a singular count noun immediately preceded by a definite article may not be deleted if there is a following modifier.)

#### Structure Change:

(1) Add [+PRO] to 3

(2) Delete 4

#### Notes

1. This T-rule deletes the prop-noun one, after certain determiners when there is no intervening modifier.

2. In the case of the non-demonstrative definite article, which is always [+N DEL], the resulting forms are that, those, and the third person pronouns. That and those occur when there is a post-nominal modifier, with mass and plural nouns respectively:

(201) He preferred the wheat from Canada to that from Nebraska.



- (202) The arguments presented today are stronger than those presented last week.

The noun node may not be deleted at all, however, if there is a postnominal modifier with a singular count noun:

- (203) He preferred the book he bought to  $\left\{ \begin{array}{l} *that \\ *it \\ the\ one \end{array} \right\}$  from the library.

When there is no postnominal modifier, the noun node is always deleted, (N.B. This in fact appears to be optional after the copula, e.g.

- (204) You remember the girl I told you about? Well, that's the one;

we have not allowed this special option here). In these cases, the article is the only constituent remaining in the NP, and it takes the form of a personal pronoun. The entries in the surface lexicon for the forms of the definite article therefore include the environmental feature  $\pm_{NP}[\ ]$  with the value + for personal pronouns and - for that and those. See DET for all the surface lexical entries for the definite article.

3. Since generic NP's are subject to PERSONAL PRONOUN REDUCTION, we have followed Postal in claiming that all generics are definite in the deep structure.

- (205) (a) They say porridge is good for you, but I can't stand it, [Wolfe 45] must come from  
(b) They say porridge is good for you, but I can't stand porridge.

Note that

- (c) \*They say porridge is good for you, but I can't stand the porridge.

is anomalous as a variant of (a) or (b).

4. Operation of this rule seems to be idiosyncratic to certain determiners which do not seem to form any kind of a natural class. They are marked in the lexicon with the feature [+N DEL]. The determiners to which this must apply include a/some/any, many, several, plenty of, a lot of, lots of, more, no, cardinal numbers, possessives, and all definite articles. (See DET)

5. This feature i.e. [+N DEL] is apparently optional with some determiners, such as (n)either, this [-Pl], that [-Pl], other,

and any [-Pl]. For these determiners, the value of the feature is chosen before lexical insertion into the base. (See DET)

6. The situation with regard to the demonstratives is more complicated. When reducing a repeated NP Fillmore obligatorily supplies one after [+Dem]. But it would seem that this is, in some dialects at least, optional in the singular:

(206) She likes this dress and I like that dress.

(207) (a) She likes this dress and I like that one.  
(b) She likes this dress and I like that.

Further, in the plural \*those ones, \*these ones are, I think, of at least doubtful grammaticality for everyone. Poutsma notes:

"after the single demonstrative the anaphoric one is frequent enough, its application not being determined, however, by any principal of syntax.... Notwithstanding its distinctly antithetic force, the demonstrative mostly stands without one, probably owing to its being apprehended as a substantive word...

The plural demonstratives are but rarely found with anaphoric one."

Since the singular/plural distinction seems to affect the rule, the solution cannot be in the inherent features of this/that. Fillmore does derive this/that without one, but only as a deictic, never in the anaphoric sense as in (207.b). This is clearly not sufficient. Further, since he can get one only in anaphoric uses, he cannot derive:

(208) { This } one is my favorite.  
      { That }

Further, one would presume that he would be forced to derive:

(209) (a) \*You go this way and I'll go that one.

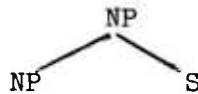
rather than

(b) You go this way and I'll go that.

This particular case may however be related rather to the question of whether certain adverbials can be pronominalized at all (cf. II. D.5.). Clearly, Fillmore's solution is oversimplified; we have, however, no alternative to offer other than that of always making deletion of one optional after singular this/that, and obligatory following these/those, which is clearly cumbersome and ad hoc.

7. Some of these determiners have variant phonological forms when the noun node is deleted. These include no/none, a/one, my/mine, your/yours, her/hers, our/ours, their/theirs, other [+Pl]/others, the [-Count]/that. This is a matter of second lexical lookup, and the forms are easily distinguished by the feature [-Pro].

8. Since personal pronouns can have non-restrictive relatives but no other postnominal modifiers, it must be seen to that non-restrictive relatives fall outside the lowest NP. Perhaps the derived structure should be:

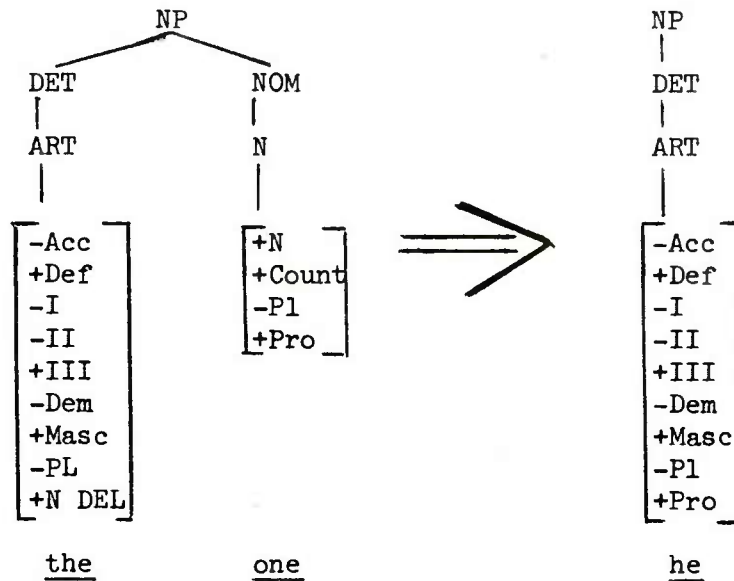


(Non-restrictive relatives are not being treated.)

Example in Tree Form:

(210)

(211)



Examples:

(a) Allowed

(212) I thought of a bird and one flew by.

(213) I looked at the books and decided to buy some.

- (214) (N)either (one) is ungrammatical.
- (215) I liked the books so much she lent me some more.
- (216) He likes the wheat from Canada; and I like it too.
- (217) He likes the wheat from Canada and I like that  
from Nebraska.

(b) Disallowed and ungrammatical

- (218) \*When a man came in, we all looked at the one.
- (219) \*We ones are collecting a lot of papers on syntax.
- (220) \*When the girls came in I looked at the with red hair.
- (221) \*He liked the wheat from Chicago but I preferred  
the from Nebraska.
- (222) \*I thought of a bird and a flew by.
- (223) \*He left his book at home but I brought my.
- (224) \*He wrote some short papers but I wrote no.

Justification: See II.A., II.B.2., and II.C.

D. Special Low-Level Rules

1. ELSE (oblig)

Structure Index:

X	[+Attach]	<u>other</u>	[+Attach]	X
1	2	3	4	5

Structure Change:

- (1) Attach else as right sister of 4
- (2) Delete 3

Examples:

- (225) \*Some other body  $\Rightarrow$  some body else ( $\neq$ somebody else  
by next rule)
- (226) \*Every other -thing  $\Rightarrow$  every -thing else
- (227) \*No other where  $\Rightarrow$  no where else

Justification:

Else cannot occur except with compounds formed by the article attachment rule. These compounds do not allow post-nominal modifiers to be preposed, e.g. someone nice, \*nice someone, but other is not derived from a postnominal modifier, so if we did not have this rule there would presumably have to be an explicit blocking rule to prevent the ungrammatical examples above. The rule is also semantically impeccable.

2. ARTICLE ATTACHMENT (oblig)

Structure Index:

X	D[[+Attach]]	N[[+Attach]]	X
1	2	3	4

Structure Change:

1 - Ø - § + 2 + 3 + § - 4

Notes:

1. N stems marked [+Attach] include -one (only the one of someone, everyone, etc.), thing, body, place, time, times, and self (self is not in the base, but acquires the feature [+Attach] as part of the reflexivization transformation.) D stems marked [+Attach] include some (any, no), every, and the definite article which has gotten the feature [+Reflexive].

2. The added §'s are an ad hoc device to signal "word-formation", about-the exact mechanism of which no claim is being made.

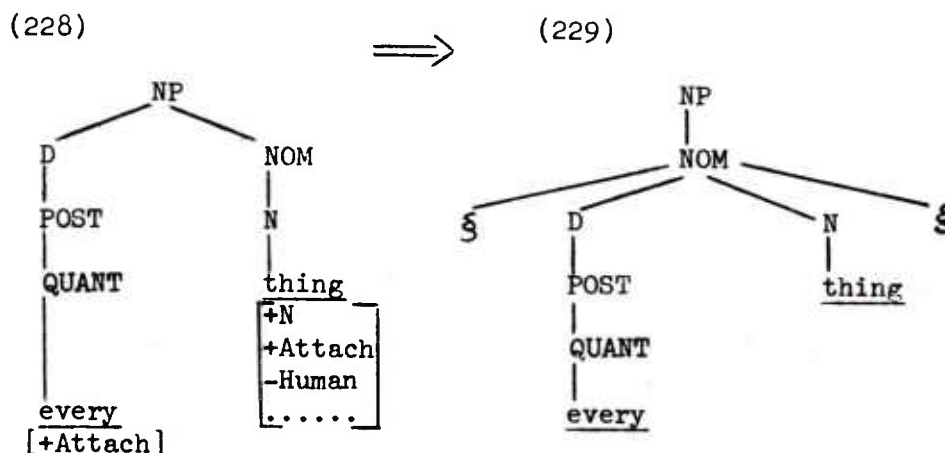
3. There are two reasons for repositioning D (see following tree), neither of them crucial:

- a. as a further signal of "word-formation"
- b. to facilitate the blocking transformation which follows.

Since this is a late rule, the repositioning of D is not expected to have many repercussions. Virtually any alternative which gave a derived structure recognizably different from the original structure would be acceptable from our point of view, including simply a more sophisticated second lexical lookup along the lines being advocated by Gruber, which would obviate the need for the following blocking transformation.

4. The rule mentions D rather than ART because it must apply to the QUANT's every and any.

Tree example:



Examples:

(a) Grammatical, generated

- (230) everything, anyone, no one, someplace, himself, yourselves and derivatively somewhere, ever, what, etc.

(b) Grammatical, not generated by this rule

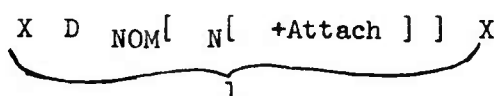
- (231) (a) Every one had been broken in shipment. (same every, different one)  
 (b) I expect to have some time next week. (different time)  
 (c) He loves his own sweet self best. (whether or not this is the same self, the rule would not apply because of the intervening modifiers)

(c) Ungrammatical, not generated

- (232) (a) \*eachone (each is not [+Attach])  
 (b) \*everyman (man is not [+Attach])

### 3. ATTACHMENT BLOCK (oblig)

Structure Index:





Structure Change:

$\emptyset$  (i.e. throw away the whole tree)

Notes:

1. This rule is necessary because there is no obvious way to constrain attachable noun stems and attachable determiners to occur only with each other, and if we allow them to go unattached we will be predicting a false ambiguity in such forms as each one (i.e. as either the 'anaphoric', [-Attach] one or the human singular [+Attach] one of someone).

2. The previous rule attaches D under NOM; a D which is not [+Attach] will thus still be to the left of NOM.

Examples:

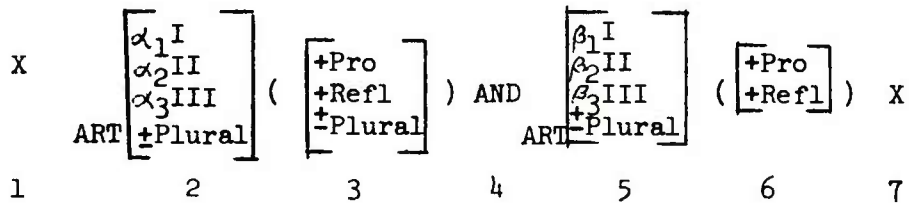
Ungrammatical and excluded: \*eachbody, \*onething, etc.

Justification:

None. We feel no fondness for this rule and would be happy to see it replaced by something like phonological blocking or a more sophisticated second lexical lookup. We would like to avoid explicit blocking rules wherever possible, since they obviously always represent weaknesses in the analysis.

#### 4. PRONOUN CONJUNCTION (partly optional)

Structure Index:



Conditions:

1. Either  $\alpha_1$  or  $\beta_1$  is -.
2. If any of  $\alpha_1, \alpha_2, \beta_1, \beta_2, = +$ , then 2 and 5 are both [+Hum]

Structure Change:

- (1) If 3 and 6 both =  $\emptyset$ , optional  
 If 3 and 6 both  $\neq \emptyset$ , obligatory  
 Otherwise go to (2)

$$1 - \begin{bmatrix} 2 \\ \gamma_1^I \\ \gamma_2^{II} \\ \gamma_3^{III} \\ +Plural \end{bmatrix} - ( \begin{bmatrix} 3 \\ +Plural \end{bmatrix} ) - \emptyset - \emptyset - \emptyset - 7$$

where:  $\gamma_1 = +$  if  $\alpha_1$  or  $\beta_1 = +$ ;  $\gamma_1 = -$  otherwise.

- (2) If 3 =  $\emptyset$  and 6  $\neq \emptyset$  or vice versa, and 2  $\neq$  5, the rule does not apply.  
 If 3 =  $\emptyset$  and 6  $\neq \emptyset$  or vice versa, and 2 = 5, obligatory:  
 1 - 2 -  $\emptyset$  -  $\emptyset$  -  $\emptyset$  -  $\emptyset$  - 7

Notes:

1. This rule optionally changes you and he to you, obligatorily changes yourself and himself to yourselves, and obligatorily changes him and himself to him. Her and himself is not changed.
2. Morphophonemically, [+I, +Plural] becomes we (us), then [+II, +Pl] becomes you, and lastly [+III, +Pl] becomes they, (them). This ordering prevents combinations such as [+I, +II] from rewriting as you, etc.
3. We allow you and you  $\Rightarrow$  you, he and he  $\Rightarrow$  they, as well as all non-identical combinations, but not I and I  $\Rightarrow$  we.
4. If the first condition is not met, the string should block, since I and I itself is not grammatical. This should probably be taken care of along with blocking \*a man and the man.
5. The second condition prevents deriving us from it and me, you from you and it, etc.

Examples:

(a) Grammatical, generated

- (233) (a) John and I helped ourselves (from himself and myself).  
 (b) You and Bill shouldn't strain yourselves. (from yourself and himself)  
 (c) When John and Mary studied harder, they did better. (from he and she)  
 (d) John and Mary washed him. (from himself and him)  
 (e) The girl didn't like it when John shot himself

- and her. (no change)
- (f) John and Mary both prefer him to her.  
(from himself and him to her and herself  
(respectively))
- (g) John and Mary each bought houses for themselves.  
(from himself and herself)

(b) Ungrammatical, not generated

- (234) \*John and I helped ~~himself~~ and myself.
- (235) \*You and Bill shouldn't strain yourself and himself.
- (236) \*You and Bill shouldn't strain yourself.
- (237) \*I and I helped ourselves.
- (238) \*John and I helped themselves.
- (239) \*John and Mary prefer himself and him to her and herself respectively.

(c) Grammatical but not generated by this rule

- (240) John and Bill each promised himself a vacation.  
(will obligatorily become themselves, which is correct only when vacations is plural. This is an unresolved problem.)

## E. Lexical Entries (Approximate)

### 1. INDEFINITE PRONOUNS

The one of someone, everyone, anyone, no one must be distinguished from the one of every one, any (one), each one, etc., for a number of reasons:

1. the former is always [+Human], the latter indifferently [+Human] depending on its expressed or understood antecedent (the former does not have an antecedent but is always general)

2. only the former has a synonymous variant -body

3. everyone and every one must be kept distinct, and each one is not ambiguous

4. only the latter has plural forms any ones, etc.

The thing of something must similarly be distinguished from the thing of some thing:

1. only the latter has plural forms some things, etc.

2. the latter is always a count noun, but the compound form can be mass:

- (241) (a) \*They were gathering some thing.  
(b) They were gathering something.

Similar distinctions can be seen between the combining forms -time, -times, -place and the homophonous separate words. The combining forms one, body, thing, time, place, times, etc. are related to one another by a number of further peculiarities:

1. restriction to compounds with some, (any, no), every, wh, and possibly this/that

2. else

3. possibility of -or other with some form

4. allowing postposed but not preposed modifiers:

someplace interesting/\*interesting some place  
\*some interesting place (except  
as ordinary noun)

We will distinguish the forms in the base by the feature [ $\pm$ Attach] used in the article attachment rule. Since we see no feasible way of marking either the determiners or the nouns with contextual features to allow only the right combinations, the combining determiners will also be given a feature [+Attach], and if a [+Attach] noun happens to occur with a [-Attach] determiner, the Article Attachment rule will fail to apply and the Attachment Block rule will apply. The lexical items will therefore have approximately the following features:

one as in He ate every one<sup>1</sup>, I took the blue one, He (from the one) left:

[+Pro, -Attach, {+Human,  $\pm$ Masc},  $\pm$ Pl, +Count]  
[-Human]

one/body [+Pro, +Attach, +Human, +Masc, +Count, -Pl]

---

<sup>1</sup> This one will have the same features whether it is introduced in the deep structure (thus implying an antecedent known either from discourse or extra-linguistic context) or by the operation of pronominalization. Thus the he in He is sick and the he in Schwartz says he is sick have exactly the same representations, although the second one can get that way either from the base or by pronominalizing Schwartz.

(This is probably correct for the dialects that get only

everyone helped himself; in girls' schools where one gets everyone helped herself the entry is presumably changed to [-MASC].

We do not know what to do about everyone helped themselves; should we try to get everyone was or were...for such dialects? If it is was, as we believe, then even a [+Set] feature will not help, since that is supposed to work for verb number agreement and anaphora alike.)

thing in everything, etc.:

[+Pro, +Attach, -Human, +Count, -Pl]

(Here it is certainly [-Pl] in all dialects: \*Everything will take care of themselves.)

## 2. PERSONAL PRONOUNS

$\left\{ \begin{array}{l} \text{the} \\ \text{he} \\ \text{she} \\ \text{it} \\ \text{they} \end{array} \right\} [ [+Def] \left[ \begin{array}{l} -I \\ -II \\ +III \end{array} \right] [+ \_N] [-Dem] ] \quad (\text{See DET})$

you [-Pl]: [ [+Def]  $\left[ \begin{array}{l} -I \\ +II \\ -III \end{array} \right] [+ \_N] [-Dem] ]$ 
 $\left[ \begin{array}{l} +Pro \\ +Human \\ -PL \\ -Attach \end{array} \right]$

you [+Pl] [ [+Def]  $\left\{ \begin{array}{l} \left[ \begin{array}{l} -I \\ +II \\ +III \end{array} \right] \\ \left[ \begin{array}{l} -I \\ +II \\ -III \end{array} \right] \end{array} \right\} [+ \_N] [-Dem] ]$ 
 $\left[ \begin{array}{l} +Human \\ +PL \end{array} \right]$

we [ [+Def]  $\left\{ \begin{array}{l} \left[ \begin{array}{l} +I \\ +II \\ -III \end{array} \right] \\ \left[ \begin{array}{l} +I \\ -II \\ +III \end{array} \right] \\ \left[ \begin{array}{l} +I \\ +II \\ +III \end{array} \right] \end{array} \right\} [+ \_N] [-Dem] ]$ 
 $\left[ \begin{array}{l} +Human \\ +Pl \end{array} \right]$

I [ [+Def] [+I] [+ N ] [-Dem] ]

+Pro
+Human
-Pl
-Attach

Sentences such as I am the one who has to ..., in which the verb in the embedded S is in the 3rd person, seem to present no problem, since it agrees with the subject underlying who, which must be identical with the one, which is [+III]. There is no requirement for agreement of person across the copula.

Once the determiner and one are inserted, DELETION OF NOUN NODE will operate if applicable, and no new rules are needed to produce pronouns directly in the base.

#### F. Unresolved Problems and Unexplored Areas

1. We have not handled sentence PRO-ing or the PRO-ing of any constituents other than nominals.

2. The analysis of the one of

(241) One should look out for oneself (himself).

remains a mystery. However, at least for those dialects which have the reflexive form oneself, the one is clearly an article, since that is what the first part of every reflexive is. It would appear to be a genderless human article; we have not provided in the features heretofore considered for any [-Gender] human nouns (and hence, derivatively, articles), so introducing Gender as a non-redundant feature distinct from Human would open up a position this one could fill. But it would be an article of very limited occurrence, namely, only before a noun that was [+Human, -Gender, +Pro]; and conversely, the noun with those features could only occur with that article. This solution might work, but it is certainly not attractive.

3. We have not come across any obvious candidate for the deletable unspecified subject in such nominalizations as Skiing is fun. See discussion in NOM.

4. Without underlying "performatives" (Ross 1968b), we will not generate (\*) this book was written by John and myself; in fact we won't anyway because we are only handling reflexives within the same simple sentence as their antecedents.



5. Pronominalization must follow conjunction, as is clear from the conjoined-pronoun rules in III.D.4. We hope some consistent ordering can be found but are not prepared to make any claims about it. It is conceivable that conjunction has a cycle of its own.

May 1969

## NEGATION

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## NEGATION

### I. BIBLIOGRAPHY

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### II. INTRODUCTION

Klima's article on negation (1964c) stands as one of the major works in the field of transformational studies of English, and one of the major treatises on negation within any framework. Although particular points have been improved upon by subsequent authors, and although some fundamental objections have been made (e.g. by Lakoff (1965, 1966b) and by Jackendoff (1968e), from quite different points of view), no basic alternatives thus far proposed seem capable of accounting for such a wide range of facts. The analysis embodied in our rules is therefore basically Klima's, with some modifications proposed by Fillmore (1966d) and some of our own. In section A of the introduction we describe the fundamental features of Klima's analysis; in section B, we discuss some special problems of the rule for some-any suppletion and a number of proposals for their solution. Section C is devoted to problems that arise from the notion that all sentential negation is due to a single NEG morpheme per S. In section D we discuss a radically different alternative treatment of

negation, that of Jackendoff (1968e). Section E is concerned with where the constituent NEG should be introduced in deep structure within a Klima-type approach, and with related questions about the deep structure of "preverbs", such as seldom, hardly, etc. Finally in section F we consider some special problems concerning conjunction with too, either, and neither.

#### A. Sentential Negation: Klima's Analysis

The basic thesis of Klima (1964c) is that a wide variety of sentences containing superficially quite distinct "negative" words such as not, none, never can all be analyzed as containing a constituent NEG with a single underlying deep structure position in the sentence. This sentential NEG plays a role in deep structure constraints (e.g. in the occurrences of until-phrases, modal need, and a number of idiomatic expressions such as sleep a wink, give a damn, bat an eye); it also conditions certain transformational changes within the sentence, such as some-any suppletion and Aux-attraction. It may itself be transformationally incorporated into other words (nothing, never, none, etc.); otherwise it is eventually spelled out as not.

Central to Klima's position is the convergence of several criteria for distinguishing a class of "negative sentences".

(i) Tag questions: Under a falling intonation on the tag, positive sentences take negative tags and vice versa.

- (1)(a) John has left, hasn't he?
- (b) He's unhappy about something, isn't he?
- (c) John hasn't left yet, has he?
- (d) You've never seen any of them, have you?
- (e) None of those boxes are empty, are they?

(ii) Not-even tags: Only negative sentences allow not-even tags.

- (2)(a) John doesn't like smart girls, not even pretty ones.
- (b) No one showed up, not even the leader.
- (c) \*The girls all like him, not even Mary.
- (d) \*Some of those boys dislike fish, not even perch.

(iii) Either-conjoining: In order for two conjoined sentences to have the form  $S_1$ -and  $S_2$ -either, the second sentence must be negative:

- (3)(a) John stayed at home all day, and Mary didn't go anywhere either.
- (b) \*John didn't go any where all day, and Mary stayed at home either.
- (c) John couldn't solve the problem, and none of his friends could either.
- (d) \*John isn't happy, and Mary is unhappy either.

(iv) Neither-tags: In order for the second of two either- conjoined sentences to be truncated into a neither- tag, the first sentence (as well as the second) must be negative.

- (4)(a) John couldn't go, and neither could Mary.
- (b) None of the girls liked it, and neither did any of the boys.
- (c) \*John was unhappy, and neither was Mary.

All of the above examples show that words with negative prefixes, such as unhappy and displeased, and words which are in some sense semantically negative, such as doubt or refuse, do not yield negative sentences in this sense; cf. particularly (1.b), (2.d), (3.d), (4.c).

The sentences which count as negative with respect to the above criteria all contain either not (or contracted n't) or one of the negative words no, none, nothing, never, nowhere, etc. The "pre-verbs" hardly, scarcely, rarely, seldom, barely are called "incomplete negatives" in that they make a sentence negative with respect to some but not all of the criteria; there is considerable dialect difference as to details. Few and little also appear to share many but not quite all properties of negative words.

Further evidence of a syntactic relation between not (n't) and the other negative words is provided by examples of alternations such as the following:

- (5)(a) He saw nothing of interest in it.
- (b) He didn't see anything of interest in it.
- (6)(a) He has never been on time to a meeting.
- (b) He hasn't ever been on time to a meeting.
- (7)(a) No one read the book.
- (b) The book was not read by anyone.





A later rule may incorporate NEG into the indefinites, obligatorily if any indefinite is in pre-Aux position (where 'indefinite' is here taken to mean 'output of the some-any suppletion rule'). This rule relates the (a)-(b) pairs of (5)-(8) above, and (9.b-c). Note that the rule is optional for the any-words following Aux, but that it is limited in any case to only the leftmost of a sequence of any-words in a sentence.

- (11)(a) I didn't show { anyone anything  
                                  anything to anyone } .  
(b) I showed { no one anything  
                                  nothing to anyone } .  
(c) \*I showed { anyone nothing  
                                  anything to no one } .

With a few additional restrictions, the same rule is intended to relate the following:

- (12)(a) Not many of the books had been looked at by  
          the students.  
(b) The students had not looked at many of the  
      books.  
(13)(a) Not everyone understood it.  
(b) It was not understood by everyone.

We have chosen to break this one rule of Klima's into two rules, one (NEG Attraction) to move the NEG morpheme into certain constituents containing an indefinite, and another (ANY-NO Suppletion) which deletes the NEG morpheme and adds a feature [+NEG], in the cases where the indefinites have suppletive forms.

The rules discussed so far form the core of Klima's analysis. Klima discusses and formulates rules for many other phenomena connected with negation, most of which are discussed at various points below. For Klima's treatment of the "incomplete negatives" seldom, hardly, etc., as well as some alternative treatments, see section E below. Double negatives, also treated by Klima, are discussed in D.1. The "Scope" of negation, an important question treated by Klima, Langacker, Ross, the Kiparskys, and Jackendoff, is discussed in various connections in section B.2, C.2-C.5, and D below.

## B. SOME-ANY Suppletion

### 1. Optional vs. governed by [-SPECIFIC]

Fillmore (1966d) points out that Klima's rules generate the following non-synonymous pairs as optional variants of each other.

- (14)(a) Some of us didn't go to the picnic. [38]  
 (b) None of us went to the picnic. [37]
- (15)(a) Sometimes I don't know what to do. [30]  
 (b) I don't ever know what to do. [31]
- (16)(a) Many of us didn't go to the picnic. [41]  
 (b) Not many of us went to the picnic. [40]
- (17)(a) I didn't see some of them. [45]  
 (b) I didn't see any of them. [44]

Because of the last pair, he rejects the possible suggestion that the differences in (14)-(16) are due to a distinction between "predicate negation" and "sentence negation". He suggests instead that the difference resides in the indefinite quantifiers, which may be either [+SPECIFIC] or [-SPECIFIC], where the feature [+SPECIFIC] is the same one that accounts for the ambiguity of

- (18) I told her to do something. [49]

or

- (19) I'm looking for some girls with red hair.

We have adopted this use of the feature [+SPECIFIC]; we treat it as a feature of the indefinite article; quantifiers like many are assumed to co-occur in the deep structure with an indefinite article which is later deleted (see DET for lexical entries for a, some.)

This explanation depends in part for its justification on the matching of ambiguities in positive sentences like (18) and (19) with the different forms of negation as in (14)-(17). Unfortunately, these two functions of the feature [+SPECIFIC] do not always seem to be in harmony. For instance, (20) seems at best highly awkward in the sense "there are some (specific) girls with red hair that I'm not looking for."

- (20) \*? I'm not looking for some girls with red hair.

And the ambiguity of (21), if there is any, is certainly much less obvious than the difference between (15.a) and (15.b).

- (21) Sometimes I know what to do.

Correspondingly, the difference between (17.a-b) does not seem intuitively to be matched by an ambiguity in (17.c):

(17)(c) I saw some of them.

Thus although such facts as the difference between (17.a) and (17.b) and the ambiguity of (18) and (19) all seem plausibly to have to do with some notion of [+SPECIFIC], it does not appear at this stage to be the same notion of [+SPECIFIC] that is involved in all these instances.

Part of the problem may lie in the fact that the [-SPECIFIC] interpretation is possible only in certain limited contexts, e.g. not in:

(22) Some little boys came in the door. (only [+SPECIFIC])

(23) They were staring at some gorgeous secretaries.  
(only [+SPECIFIC])

and it may well be that a NEG in the deep structure is one of the conditioning factors allowing the possibility of a [-SPECIFIC] article; thus some unambiguous positive sentences could nevertheless correspond superficially to two distinct negative ones.

Another problem for this analysis (i.e. for both Fillmore's and ours) appears when instead of the simple negative NEG (or not), a "partial" negation such as hardly or almost not is involved. For some speakers at least, the following sentences are not full paraphrases:

(24)(a) Hardly ever was any beer spilt.  
(b) Hardly any beer was ever spilt.

For some speakers, sentence (24.a) but not (24.b) would be true if only once a year or so, someone spilled a whole keg of beer; (24.b), on the other hand, would be more appropriate if a few drops of beer were spilled on more numerous occasions. A similar distinction appears in (25.a-b):

(25)(a) Almost no one ever uses the auditorium.  
(b) Almost never does anyone use the auditorium.

In this case it is perhaps clearer that only (25.b) and not (25.a) allows the possibility of large numbers of people using the auditorium on those few occasions when it is used at all.

The problem raised by (24) and (25), for those speakers who recognize such a distinction, casts doubt on the proposed analysis if the Katz-Postal hypothesis is to be maintained. Some other conflicts

with the Katz-Postal hypothesis are discussed in C.4 and in DET.

## 2. Scope of the rule: Klima, Langacker and Ross.

In all the examples presented so far, some-any suppletion has been in the same simplex S with NEG. However, as Klima has pointed out, it can also take place in certain embedded S's, though not all.

- (26)(a) John wasn't sure that anyone would believe him.
- (b) None of them want anybody to try to force John to divulge any of the information.
- (c) \*The well-known fact that the comet will ever approach the earth again is not relevant to this argument.

Some-any suppletion also takes place in sentences subordinate to [+AFFECT] words such as dislike, doubt, unhappy, amaze, before, although not in the same simplex S with such words:

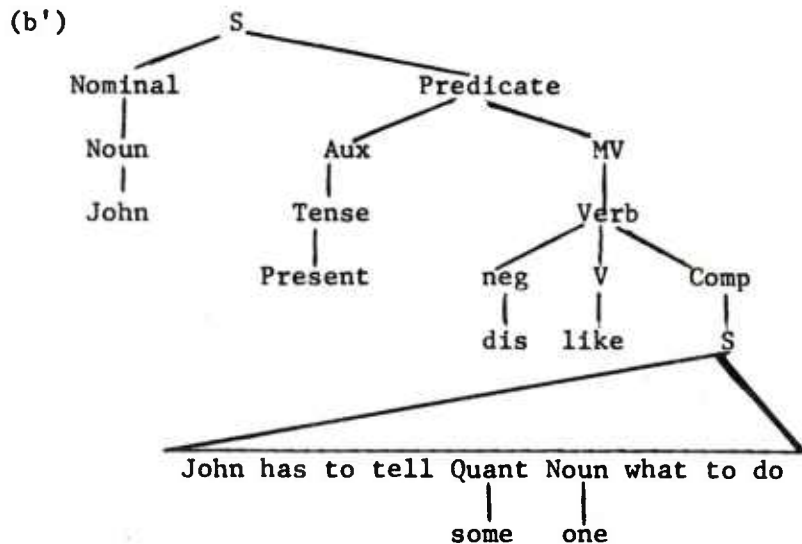
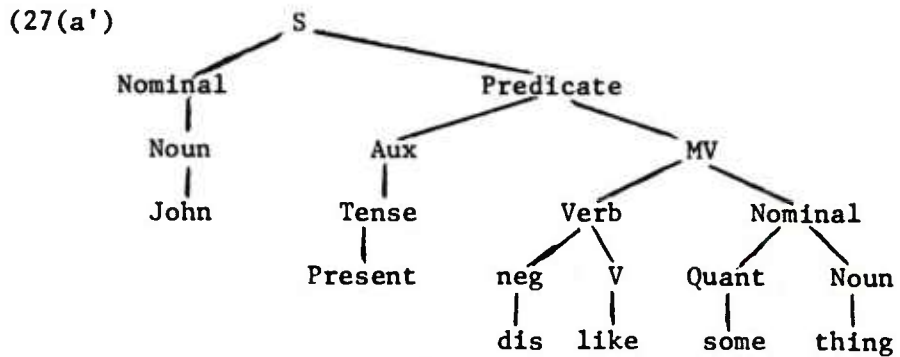
- (27)(a) \*John dislikes anyone.
- (b) John dislikes having to tell anyone what to do.
- (28)(a) \*John doubted anything.
- (b) John doubted that they would ever persuade Bill to do anything about it.

(In examples such as (27.a) and (28.a), we are here excluding possible generic any from discussion.)

Klima (1964c, p. 297-8) has described the scope as follows:

'A constituent is "in construction with" another constituent if the former is dominated by the first branching node that dominates the latter. ... The rule of Indef- incorporation can now be generalized to cover both the pre-verbal particle neg and the affix neg by restricting the application of the rule specifically to Quant(ifiers) "in construction with" neg.'

The utility of this notion for Klima's analysis depends in part on his expansion of verb phrases, which assign very different structural positions to noun phrase objects and sentential complements. Thus (27.a-b) would be assigned roughly the trees (27.a'-b') below:



By Klima's definition, the only elements in construction with neg in these two trees are those dominated by the first branching node above neg, i.e. those dominated by Verb. This includes the Quant in the Comp in (27.b'), but not the Quant in the Nominal in (27.a), thus accounting for the difference in grammaticality between (27.a) and (27.b). (In an ordinary negative sentence, neg is immediately dominated by S, so everything dominated by that S is in construction with the neg.)

However, Rosenbaum (1967a) argued that at least some "complements" are in fact nominalizations in direct object position. The UESP analysis (see NOM) goes further and claims that virtually all complements are nominalizations in neutral case, but the extent



to which our analysis diverges from Rosenbaum's is not relevant to the present argument. The crucial point is that in both the UESP analysis and Rosenbaum's, the (a) and (b) sentences of both (27) and (28) have direct objects (all derived, in this instance, from NEUTral case), so that Klima's notion of "in construction with", dependent on the difference between trees (27.a') and (27.b'), does not any longer distinguish between them.

The only major distinction between the trees that we would draw for (27.a-b) is one between sentential and non-sentential object. We do not see any obvious way of relating this environment to the sentential NEG environment in such a way as to make a single condition governing the suppletion rule.

Langacker (1966) suggests that the notion of "command" is more general than Klima's notion "in construction with" but at the same time accounts for all the relevant data of negation, and therefore is to be preferred. The notion "command" is defined as follows:

A node A "commands" another node B if (1) A does not dominate B; (2) B does not dominate A; (3) A is in structure  $S^1$ ; and (4) node  $S^1$  dominates B.

Langacker shows that this notion is superior to "in construction with" for pronominalization. Since in Klima's analysis the node NEG is immediately dominated by S, it will ordinarily be the case that whenever NEG commands a node A, node A will be in construction with NEG. The two notions will certainly differ in the case of [+AFFECT] words, however, which Langacker does not discuss at all; in those cases Langacker's condition will not do as well as Klima's (given Klima's PS-rules, at least), since Langacker's condition, if extended to include the overlooked [+AFFECT]-words, would allow not only (27.a) and (28.a), but also the following:

- (29)(a) \*Anyone disliked anything  
(b) \*John ever doubted that we would come.

Langacker was not dealing with the [+AFFECT] words, however; we will return to this problem later after discussing some of the other phenomena with which Langacker was concerned. In discussing NEG, he noted some relative clause counterexamples such as (39) below, and agreed that neither "in construction with" nor "commands" could exclude them. He proposed simply that a special condition excluding

relative clauses from the scope of some-any suppletion would be required. The case for which he considered "command" to be particularly useful does not actually involve the some-any rule, but rather the any-no suppletion rule (specifically, that part of it which we have called NEG Attraction). The two rules do not have identical environmental constraints, but are sufficiently similar to justify including this part of the discussion here.

To account for the ambiguity of

- (30) I will force you to marry no one. [Klima (130.b);  
Langacker (85)]

Klima postulates two underlying structures each with one NEG, one with NEG in the matrix S and the other with NEG in the embedded S. He then allows Neg-attraction to move NEG from the matrix into the indefinite NP of the embedded S. For this example, either "command" or "in construction with" is an appropriate condition on NEG-attraction. However, as Langacker points out, if both matrix and embedded S had contained NEG, as in (31.a), NEG-attraction should not be permitted to move the matrix NEG into the embedded S (31.b).

- (31)(a) I won't force you not to marry anyone. [L 88]  
(b) \*I will force you not to marry no one. [L 89]

Langacker notes that an ad hoc restriction that NEG-attraction not be permitted to move one NEG across a string already containing a NEG would not be correct, since it would exclude the grammatical (and ambiguous) sentence:

- (32) I will force the girl who doesn't want children  
to marry no one. [L 90]

The relevant difference between (31.b) and (32) can be expressed in terms of command: the matrix NEG cannot be moved into an embedded constituent which is commanded by an embedded NEG. Thus, if NEG<sub>1</sub> and NEG<sub>2</sub> both command some and NEG<sub>1</sub> commands NEG<sub>2</sub>, but not vice versa, NEG-attraction cannot attach NEG<sub>1</sub> to some. Langacker suggests a generalization of this phenomenon which he calls the "principle of control", but does not offer further applications of it. It would appear that in this case Klima's "in construction with", if extended to a notion like "control", would have made exactly the same distinction. Langacker does not deny this; his claim is simply that "command" works as well as "in construction with" for negation, and much better for pronominalization (but cf. remarks on [+AFFECT] words above).

Ross (1967c) discussed the some-any (Indefinite Incorporation) rule in connection with several of his proposed constraints. His form of the rule, stated in two parts to allow both forward and backward application, is:

(33) INDEFINITE INCORPORATION [Ross 5.71]

a. X - [+Affective] - Y - [+Indeterminate] - Z

1	2	3	4	5	⇒
1	-	2	-	3	-
			<div style="border: 1px solid black; padding: 2px; display: inline-block;"> 4 +Indefinite </div>	-	5

b. X - [+Indeterminate] - Y - [+Affective] - Z

1	2	3	4	5	⇒
1	-	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> 2 +Indefinite </div>	-	3	-
			4	-	5

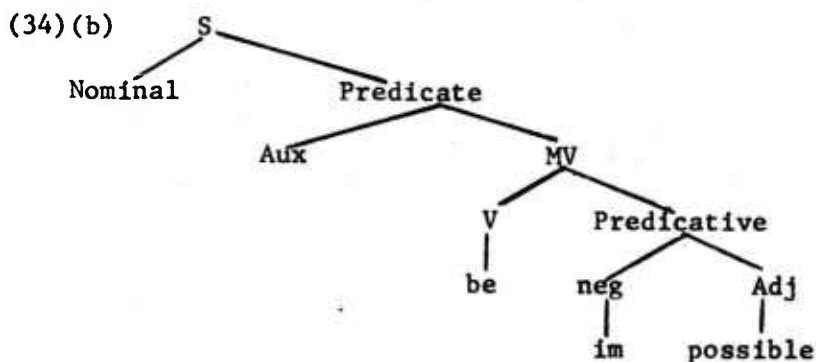
In place of Klima's "in construction with", he proposes that the rule be upward-bounded with respect to feature-changing: i.e. the constituent whose features are changed cannot be outside the limits of the structure dominated by the lowest S dominating the other non-variable constituents of the S.I. Thus in this case the scope of the rule includes the S dominating the [+Affective] element and everything subordinate to that S.

Ross rightly states that upward-bounding formalizes the suggestion in the remark he attributes to Klima, "that the change can take place in the same clause as the one in which the [+Affective] element appears, or in any clause subordinate to it." [Ross, p.314] However, he, like Langacker, overlooked an important distinction which Klima explicitly made: the quoted statement is true for such [+Affective] elements as NEG, WH, and only, but it is not true for words like doubt, unlikely, afraid, dislike, etc. As pointed out above (cf. (27), (28)), the latter words do not trigger some-any suppletion within their own simplex, or even in arbitrary clauses subordinate to that simplex, but only in clauses subordinate to those very lexical items, if we may speak of a clause being subordinate to a particular constituent. This is clearly an important part of the reason Klima chose such a specific notion "in construction with", rather than a more general one such as "command" or "upward-bounded".

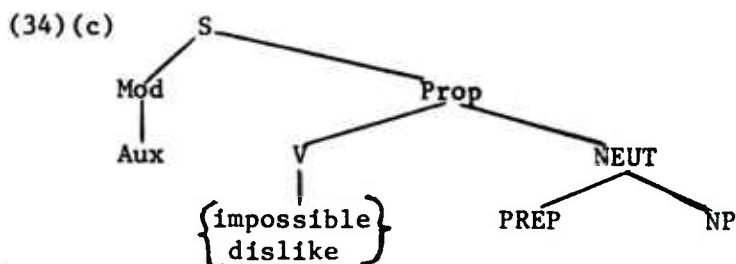
We have argued above that the PS-rules Klima needed in order for "in construction with" to discriminate the (a) and (b) sentences of (27) and (28) are incorrect; Ross also notes a specific problem for Klima's analysis in

(34)(a) That Jack ever slept is impossible. [R 5.125.b]

where the subject-clause, in which some-any suppletion has taken place, is not in construction with the [+AFFECT] word impossible, i.e. is not dominated by the node (Predicative) which immediately dominates impossible: cf. (34.b).



Note that within our case grammar framework, impossible will occur in the same kind of frame as e.g. dislike, namely as a verb with a neutral case NP (plus a further case for dislike), so that as long as some-any suppletion precedes case-placement, the rules can be made to work identically on the two superficially different structures.



Note that with impossible, as with dislike, it is only a sentential expansion of NP which permits some-any suppletion:

(34)(d) \*Anything was impossible.

Thus the crucial difference between our analysis and Klima's that will cause (34.a) be treated in a manner exactly parallel to (27) and (28) in our grammar is two fold: (a) all adjectives are analyzed as V, and (b) all "complements" on adjectives in verbs, including those which end up as surface subjects as in (34.a), are introduced as NP's analyzed as particular cases within the PROP.

Ross goes on to state (sec. 5.2) that "command" is in fact a more useful notion than "upward-bounding"; and because of application to pronominalization and a number of other phenomena, either one is more useful than "in construction with". But, since both he and Langacker overlooked Klima's observation that the lexical [+AFFECT] words do not trigger some-any suppletion throughout the simplex in which they occur, their constraints do not in fact correctly characterize the scope of the some-any rule, except in the subcases where the triggering element is NEG, WH, only, or the like. We have therefore had to make the S.I. of the some-any rule more detailed than Ross proposed.

Some of Ross's other constraints do appear to account nicely for some of the other exceptions to Klima's some-any rule, and these we are incorporating. Ross attributes to Kiparsky the insight that the restrictions on feature-changing rules (such as some-any suppletion) exactly parallel those on "chopping" rules (such as Question).

- (35)(a) Do you believe that anybody was looking for anything? [5.73.e]
- (b) \*Do you believe the claim that anybody was looking for anything? [5.73.e']
- (36)(a) Waldo didn't report that anyone had left. [6.194.a]
- (b) \*Waldo didn't report the fact that anyone had left.

Sentences (35.b) and (36.b) are excluded by Ross's complex-NP constraint (cf. REL for statement and further application of this and other constraints). The ungrammatical sentences below are excluded by the coordinate-structure constraint:

- (37)(a) \*I didn't eat the ice cream and any cake. [6.201.b]
- (b) \*I didn't realize that it had rained and any crops had been destroyed. [6.203.b]



But in these cases there are relatively unexplored complications in the relation of and and or in conjunctions containing negation, so the facts are less clear. The sentential-subject constraint also seems to be operative, but again the evidence is not entirely clear; it depends on the intuition that (38.a) below is significantly worse than (38.b), and that (38.c) is acceptable:

- (38)(a) \*I deny that that MacIntyre has any money is certain. [6.214.a]
- (b) ?I deny that that MacIntyre has some money is certain. [6.214]
- (c) I deny that it is certain that MacIntyre has any money. [6.214.b]

In discussing the applicability of the complex-NP constraint to the some-any rule, Ross draws an interesting new distinction that appears to be necessary, between some-any suppletion as conditioned by factors such as Klima suggests and a separate rule of some-any suppletion in relative clauses, the latter being governed by constituents in the determiner of the head noun. He notes the impossibility of applying ordinary some-any suppletion into relative clauses in examples like (39) below.

- (39)(a) I never met that man who somebody tried to kill. [R(5.72.f)]
- (b) \*I never met that man who anybody tried to kill. [R(5.73.f)]
- (c) This isn't the man who is looking for some Bantam roosters.
- (d) \*This isn't the man who is looking for any Bantam roosters.
- (e) I didn't kill the woman who had some money. [Langacker (83)]
- (f) \*I didn't kill the woman who had any money. [Langacker (84)]

In Ross's examples (39.a-b) it could be argued from the point of view of our analysis that somebody can only be [+SPECIFIC] in that environment, and that it is that factor that prevents suppletion. But that is certainly not the case in (39.c-d), and probably not in (39.e-f). (Langacker noted these examples but did not attempt to draw any general conclusions from them.)

Ross contrasts examples such as the above with cases where suppletion does apply in relative clauses even where there is no negative element in the sentence:



- (40)(a) Anybody who ever swears at me better watch his step. [6.195.b]
- (b) Everybody around here who ever buys anything on credit talks in his sleep. [6.195.c]
- (c) I want all the students who have ever tried to pat Macavity to show me their scars. [6.195.d]

Furthermore, Ross shows that relative clause some-any suppletion must follow ordinary some-any suppletion, since the suppletive any is one of the determiners which triggers suppletion within a relative clause. That some, whether [+SPECIFIC] or [-SPECIFIC], is not one of the determiners that causes relative clause suppletion can be seen from the following:

- (41)(a) \*I need some books which have anything to do with metaphysics.
- (b) \*I can't remember the name of somebody who had any misgivings. [6.196]

But if ordinary suppletion has already been applied, (42) is possible:

- (42) I can't remember the name of anybody who had any misgivings. [6.196]

Ross points out a very odd property of the relative clause some-any rule, namely that it applies in an "anti-cyclic" order: since it is the higher determiner that triggers the change in a lower one, and since an unconverted some cannot trigger any changes below it, sentences like the following apparently result only from a top-to-bottom cycle of application (the subscripts indicate the cycles):

- (43) Everybody who has ever<sub>1</sub> worked in any<sub>1</sub> office which contained any<sub>2</sub> typewriter which had ever<sub>3</sub> been used to type any<sub>3</sub> letters which had to be signed by any<sub>4</sub> administrator who ever<sub>5</sub> worked in any<sub>5</sub> department like mine will know what I mean. [6.198]

However, it is not clear that this "anti-cyclic" order would have to be stated explicitly. If we were simply to state that the rule may reapply to its own output, and that it only applies in a relative clause S immediately dominated by the NP (or NOM, or whatever we take to be the node just over the S) which has the conditioning DET, then the "anti-cyclic" ordering would be an automatic consequence of what structure satisfied the S.I. of the rule on each reapplication: i.e. that part of the ordering would be intrinsic. It is not clear to us whether any of Ross's constraints would account for the immediate dominance condition just stated; that problem seems in any case to be independent of the ordering question.

The determiners which allow the relative clause some-any suppletion are, according to Ross: no, any, a, every, all, the first, the last, the Adj+ est, the only. What syntactic feature(s) should be held responsible is not clear.

In summary, we have two some-any suppletion rules. The first depends on the feature [+AFFECT], and is constrained equally well by "in construction with", "commands", and "upward bounding". All of these are relevant when the [+AFFECT] element is NEG, WH, only, but unless Klima's particular verb-phrase structure is accepted (and we have argued against it above), none of these are relevant when the item is doubt, dislike, afraid, etc.; only Klima's analysis ever takes cognizance of this case. The second some-any rule applies in topmost relative clauses under the influence of an appropriate determiner; we know of no general constraints for it and have simply written the details into the rule.

#### C. Problems with One NEG per S.

##### 1. Double negatives.

The most obvious problem for any analysis which postulates a deep structure NEG occurring at most once per simplex S is the existence of sentences with more than one sentential-type negative:

- (44)(a) He doesn't often really not understand.  
[Klima, fn. 11]
- (b) Chomsky doesn't not pay taxes for nothing.
- (c) Never before had none of his friends come to one of his parties. [Jackendoff (1968e) 98]
- (d) None of his friends had never come to one of his parties before. [J 99]
- (e) No one had nothing to eat.

Klima, noting (44.a), admits two NEG's per S, but only with an intervening adverb:

- (45) S → (WH) (NEG) (ADV(NEG)) (ADV) NOMINAL-PREDICATE

However, sentence (44.b) contains three negatives, and sentence (44.e) has two negatives without having any adverb. Sentences (44.c) and (44.d) each have the same two constituents negated, but the different order yields quite distinct semantic interpretations.

The question of grammaticality for double negation is complicated by the existence of a substandard dialect which, like Chaucerian English, converts all some's directly into no's in negative sentences, rather than leaving all but one of them as any's. Typical examples are:

- (46)(a) (\*) I didn't see nobody nowhere.
- (b) (\*) They don't never tell me nothing.
- (c) (\*) You can't hardly get them kind no more.

In such instances, the possibility of finding an interpretation along the lines of (44) is clouded by the existence of this common substandard dialect. An intuitively relevant factor which cannot be reasonably built into a model such as ours is that there are usually multiple-sentence paraphrases for simplex sentences with multiple negation, and that the former are usually "preferred". Two common devices for such paraphrases are "there is/are" sentences and cleft sentences.

- (47)(a) It isn't often that he really doesn't understand.
- (b) There were none of his friends that had never come to one of his parties before.
- (c) There was no one who had nothing to eat.

Another point relevant to the cases which include adverbs is that even with only one negative, the position of the negative with respect to the adverb can influence the meaning in a way that seems directly related to having two negatives with the adverb.

- (48)(a) He doesn't really like her.
- (b) He really doesn't like her.
- (c) He doesn't really not like her.
- (49)(a) He hasn't often paid taxes.
- (b) He often hasn't paid taxes.
- (c) He hasn't often not paid taxes.

There are many difficulties with adverbs, including their "scope" relative to one another, and, as here, their "scope" relative to NEG in a given sentence. These problems seems to be closely interconnected, and we do not have solutions for any of them. With respect to (49), we choose to generate (49.a) as the result of the single sentence NEG, and we do not generate (49.b) or (49.c) at all. There are two reasons not to call (49.b) ordinary sentence negation:

(i) Only (49.a) is perfectly acceptable with the tag has he?; (49.b) does not in fact feel comfortable with either has he? or hasn't he?.

(ii) (49.a) and (b) are not paraphrases. The difference is subtle, but can perhaps be seen in the following situations:

CASE A: A young immigrant is having difficulty filling out his income tax form because he hasn't had much practice at it, since he has not often paid taxes. (a) is true for him, (b) is false.

CASE B: An old tycoon who has often paid lots of tax is getting adept at finding exemptions and deductions and has been so successful at it that he has often not paid taxes, although it is also true that he has often paid taxes -- he has done a lot of both. (b) is true for him, (a) false.

In short, (b) can only be true if there have been many opportunities to pay taxes and expresses a voluntary avoidance thereof, while (a) has no such presuppositions. This reinforces the claim that (a) is ordinary sentence negation, whereas (b) is something more special.

On the other hand, the claim that (48.a) and (49.a) are ordinary negatives depends on the assumption that the corresponding positive sentences, (48.d) and (49.d) are simplexes.

(48)(d) He really likes her.

(49)(d) He has often paid taxes.

But if the ADV's were to be analyzed as deriving from higher S's, as seems plausible, then the (b) forms of (48)-(49) would be negating simplexes, with the ADV dominating the whole negated simplex; the (a) forms would thus be specifically negating (the higher sentences containing) really, often.

We believe that examples like (49) pose a very serious problem for the analysis proposed here, but we see no solution at present. We have chosen not to generate any multiply negative sentences, since a correct analysis would appear to require a much more thorough prior analysis of adverbs and their scope, and of the possible effects on semantic interpretation of reordering-rules (as in 44.c, d).

## 2. Ambiguous sentences with adverbials.

Lakoff (1965) cites the interesting ambiguous sentence:

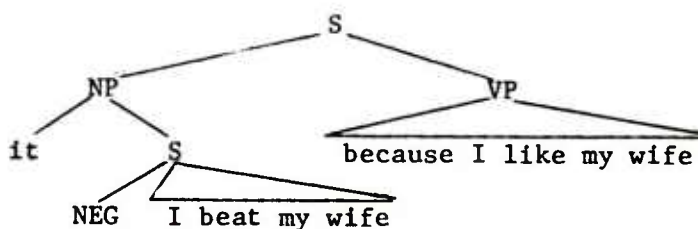
- (50) I don't beat my wife because I like her. [Lakoff F-6-3]

which has the two possible interpretations:

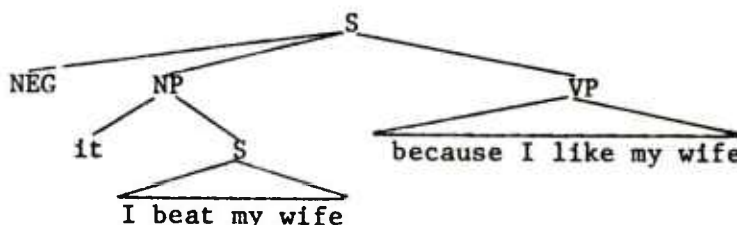
- (51)(a) It is because I like her that I don't beat my wife. [F-6-4]  
 (b) It is not because I like her that I beat my wife. [F-6-5]

Corresponding to these two interpretations he has the following two deep structures:

(52)(a)



(52)(b)



Lakoff postulates a two-sentence source for many other types of adverbials, including locative, instrumental, and frequency adverbials. He claims that these other types forbid NEG ("however it is to be formally stated") from occurring in the embedded sentence, because "one cannot assert the location (frequency, etc.) of an event that does not occur."

It is only this restriction, which is nowhere explicitly formulated, which differentiates the ambiguity of negation with because-clauses from the purported non-ambiguity of negation with other types of adverbials. However, the restriction appears to be too strong, since there are certain cases where the negation of an



event may, loosely speaking, itself be an event, e.g. not paying taxes, not getting up early, not going to church, not eating dinner, not thinking clearly (semantically, the "event" seems to be the breaking of a habitual or expected pattern of activity). Such "negative events" certainly allow frequency adverbs (cf. (49.b), (53.c,d)), perhaps locative adverbials, but apparently not instrumental adverbs. In the following examples, at least one interpretation seems to involve the adverb modifying the whole negated S:

- (53)(a) I don't get up early at home.
- (b) He doesn't go to church at the university.
- (c) He sometimes doesn't eat dinner.
- (d) He doesn't eat dinner two nights a week.

Both (53.a) and (53.b) may perhaps be while-clauses rather than locatives in one underlying structure; (53.c) is unambiguous; (53.d) on the reading under discussion sounds much better with the adverb preposed.

There are certainly serious problems facing any analysis which, like ours, includes NEG and the various adverbs within the simplex sentence in fixed slots, since the ambiguity of (50) is then left unaccounted for, as is the difference between the (a) and (b) sentences of (48) and (49). Noting that the ambiguity of (53.b) might be attributable to a distinction between a true location and a while-clause, one could look for a similar distinction between superficially identical because-clauses. In particular, the intonational difference which can disambiguate (50) suggests a distinction between a "conjunction" because and a "restrictive adverbial" because. The conjunction form would be "insulated" from the NEG by Ross's Coordinate Structure Constraint. However, since these notions are still quite vague and not formally justified, and there are many other problems concerning adverbs which we have not been able to solve, the analysis of (50) remains an unsolved problem in our system.

### 3. Negatives with modals.

Both Hofmann (1964) and Boyd and Thorne (1968) touch on the ambiguity of such sentences as:

- (54)(a) John may not leave tomorrow.
- (b) The solution must not be obvious.

Ross (1967a) did not include any such examples among his arguments for treating auxiliaries as main verbs, but presumably he could have. Boyd and Thorne's analysis of modals does not have a clear interpretation within ordinary transformational grammar; Hofmann's proposal



is essentially that the sentences of (54) each have one deep structure with an ordinary negated simplex and one with an "epistemic" modal, roughly:

- (55)(a) It may be (true) that John will not leave tomorrow.  
 (b) It must be (true) that the solution is not obvious.

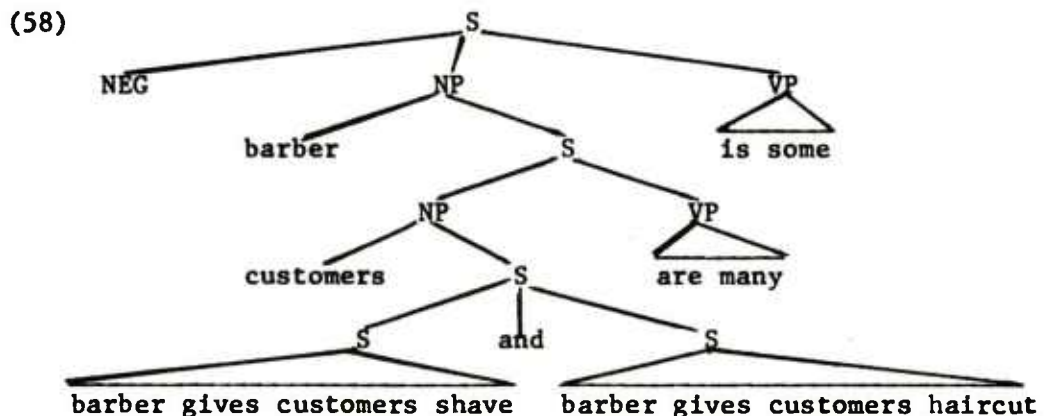
There are some modals, such as might, which can have only the epistemic sense of (55), and others such as will which can have only the non-epistemic sense. We consider something along the lines of Hofmann's suggestions quite plausible, and syntactically quite well motivated for a number of reasons in addition to the cited ambiguities, but we have not built into our rules any apparatus for handling the epistemic modals. Therefore all case of negation with modals generated in our grammar are to be taken in the non-epistemic sense.

#### 4. Negatives with conjunction.

We are presently deriving (56) from (57):

- (56) No barber gives many customers both a shave and a haircut.  
 (57) No barber gives many customers a shave and no barber gives many customers a haircut.

The two sentences are clearly not synonymous, however. A semantically more appropriate deep structure, along the lines suggested by Lakoff (1965), would be (58) (cf. Partee (1968)):



But syntactic arguments against treating quantifiers as predicates are given in DET. We have not found or been able to invent a structure which could simultaneously satisfy the semantic and syntactic requirements; sentences such as (56) pose an important problem for future research.

### 5. "NEG-raising".

For certain matrix verbs, Klima proposes a special analysis in connection with embedded NEG's, with which we disagree. Consider the following pairs:

- (59)(a) I think he won't tell her.
- (b) I don't think he will tell her.
  
- (60)(a) It's likely that he won't get there until after the game.
- (b) It's not likely that he will get there until after the game.
  
- (61)(a) John knows they aren't here.
- (b) John doesn't know they're here.

For Klima, as for us, (59.a), (60.a) and (61.a) have a sentence NEG in the embedded sentence only. In our analysis (59.b), (60.b), and (61.b) have a sentence NEG in the matrix only, and the fact that the (59) and (60) pairs are nearly synonymous is regarded as due simply to the meaning of words like think and likely. Klima, however, assumes an underlying NEG in both matrix and constituent in (59.b) and (60.b), which would predict a radical difference in meaning: (59.b) should be the negative of (59.a) and (60.b) of (60.a). His main argument for his analysis is to account for the possibility of such items as until after the game in (60.b), which could not occur in a corresponding positive sentence. Similarly restricted items are need and help as in:

- (62) I don't suppose I need mention this again.
- (63) I don't think John can help his bad manners.

Although we do not know how to state the restrictions on the occurrence of these items, we claim that they are not restricted to sentences containing a sentence NEG, because at least some of them can also occur in questions:

- (64) Need he accept any of them?

(65) Who could help laughing at that?

(but (66) \*Did he arrive this time until 5 o'clock?)

Furthermore, they can even appear sometimes embedded in questions, where the embedded sentence may not itself be analyzed as a question:

(67) ?Do you think he need accept anything from them?

(68) ?Did you suppose I could help laughing?

(69) (?) Why would you expect him to start signing autographs until after the game is over?

Hence, we would argue that it is quite plausible that a NEG in a matrix sentence may constitute a sufficient environment for such items in an embedded sentence, and we therefore have not postulated any NEG's in embedded sentences which become absorbed by matrix NEG's or [+AFFECT] words. This solution avoids the incorrect semantic consequences of Klima's analysis.

For the sentences

(70) He dislikes doing nothing all summer.

(71) It isn't likely that there won't be any rain in January.

which for us have an ordinary negative constituent sentence, Klima's analysis claims an underlying double negative in the constituent sentence. Besides being semantically inappropriate, this is in fact disallowed by Klima's own rules, since he allows two negatives only with an intervening adverb such as often or really. This would appear to further weaken his argument for embedded NEG's being absorbed into the matrix.

Kiparsky and Kiparsky (1968) suggest that the relevant rule is NEG-raising rather than NEG-absorption. Thus they would claim that (59.b) and (60.b) are derived from (59.a) and (60.a) respectively. Then they claim that the failure of NEG-raising to apply in factives (cf. NOM) is attributable to the complex-NP constraint, which prevents, for example, the derivation of (72.b) from (72.a).

(72)(a) It bothers me that he won't lift a finger until it's too late.

(b) \*It doesn't bother me that he will lift a finger until it's too late.

But there are many non-factives which do not allow NEG-raising either, if synonymy is a criterion:

- (73)(a) I didn't claim that I was right.
- (b) I claimed that I wasn't right.

- (74)(a) I wasn't sure that you were coming.
- (b) I was sure that you weren't coming.

Similar examples can be constructed with assume, conclude, maintain, assert, positive, certain.

Furthermore, unless there is an ad hoc constraint to prevent it, sentence (59.b) and other such examples which lack special constituents like until-phrases will have a derivation with NEG in the matrix sentence anyway, so the rule of NEG-raising will predict an ambiguity which is not present, or is at best debatable (cf. Jackendoff (1968c) for more on this point).

Lakoff (1965) assumes without argument a rule of NEG-raising, which he calls "not-transportation" (section IV.1). He does not relate it to any general properties of matrix verbs, but simply posits an exception feature for it.

It would seem to us that the synonymy of certain non-factive pairs such as (59.a-b) and (60.a-b) is best accounted for with the NEG generated in the clause in which it eventually appears, coupled with the following semantic observation: Non-factives express "propositional attitudes" (a term due to Bertrand Russell); in some cases it happens that a negative attitude toward a positive sentence may be very nearly or perhaps perfectly equivalent to a positive attitude toward a negative sentence; this seems to be true when either (i) the attitude is a moderate one, such as think, believe, seem, or (ii) the attitude is dichotomous, such as true and false. When the attitude is a strong one such as claim or sure, however, the equivalence fails.

This approach toward an explanation is certainly not without its own problems, however. For instance, guess works like think and suppose in some dialects but not in others; but the analog of (59.a) with guess does not appear to differ in meaning between the two dialects. Furthermore, if (59.b) is indeed ambiguous in some dialects, then it would be desirable to have two sources for it.

Jackendoff (1968c) presents a semantic argument similar to the above, plus a counter-argument to the claim that a NEG in the embedded sentence of (60.b) is necessary to account for the until-phrase. This argument rests on the fact that there is no reflex of a raised NEG in the following:

- (75)(a) I doubt that John will arrive until 4:00.  
[Jackendoff 42]
- (b) Bill is afraid to leave until his mother comes. [43]
- (c) Scarcely anybody expected him to get there until after 5:00. [44]

Jackendoff's argument rests on certain theoretic assumptions, such as that lexical insertion of items like doubt, afraid, scarcely is done on the deep structure level. It might be suggested in a framework allowing more abstract deep structures that doubt, etc. are derived from a raised NEG plus some corresponding positive verb. Detailed exploration of such a proposal, although interesting, would be outside the scope of this project. It is worth noting that such a proposal would appear to require very different lexical items doubt and afraid (i.e. NEG-less ones) in the following:

- (75)(a') I doubt his story.  
(b') Bill is afraid of camels.

Klima (pp. 294-295) in fact raises very similar syntactic arguments, and even hints that the possibility of allowing the intuitively plausible NEG-raising operation is dependent upon alterations in such basic properties of the theoretical framework as place of insertion of lexical items.

Thus we claim, with Jackendoff, that there is neither a NEG-raising nor a NEG-absorption rule in the grammar. The only way a NEG can move out of its own S is by NEG-attraction (the rule which leads to any-no suppletion) and then only into lower, not higher S's.

## 6. Phrasal Negation.

Klima points out certain occurrences of not which lack the criterial properties of sentence negation.

- (76)(a) He found something interesting there not long ago, { \*and neither did she } . [186.a]  
                    {         and so did she         }  
(b) He had spoken with someone else not many hours earlier, hadn't he? [186.b]  
(c) There was some rain not long ago,  
        { \*not even in the desert } . [186.c]  
            {         even in the desert         }



They are also unlike sentence negation in not triggering AUX-attraction (77) or SOME-ANY suppletion (78), nor allowing the occurrence of until-phrases.

- (77)(a) Not long ago there was rain falling. [187.b]
- (b) \*Not long ago was there rain falling.
- (c) Not even then was there rain falling. [188.a]
- (78)(a) \*Not far away I bought any books.
- (b) In none of those stores did I buy any books.
- (79)(a) Not three weeks ago he got there before 3:00.
- (b) \*Not three weeks ago he got there until 3:00.
- (c) He almost never gets there until 3:00.

Klima suggests that these occurrences of not should be treated as the same morpheme neg which he postulates for sentence negation, but introduced in lower constituents. The evidence that it is the same morpheme neg in both cases includes sentences such as the following, which illustrate the similarity of constituent and sentential not with respect to both co-occurrences and semantic interpretation.

- (80)(a) It wasn't long ago that he found something interesting there (, was it?). [195.a]  
         [compare (76.a) above.]
- (b) He had spoken with someone else, which hadn't been many hours earlier. [195.b] [compare (76.b)]

He tentatively suggests the use of a base rule of the following sort:

Time → (neg) long  $\left\{ \begin{array}{l} \text{ago} \\ \text{after} \\ \text{before} \end{array} \right\}$

but note that if he were to make the natural extension to include subordinate structures such as after S, before S, the fact that these subordinate clauses would be in construction with the constituent neg would incorrectly predict that the some-any suppletion rule would apply within them.

- (81)(a) John came in not long  $\left\{ \begin{array}{l} \text{after} \\ \text{before} \end{array} \right\}$   $\left\{ \begin{array}{l} \text{some} \\ *any \end{array} \right\}$  of  
         the delegates stormed out.

This is particularly puzzling in view of the fact that before is itself [+AFFECT] and therefore normally allows SOME-ANY suppletion:



- (81)(b) John came in (long) before any of the delegates stormed out.

Neither Klima nor we have any solution to this problem; whatever is going on is probably also involved in sentences containing not plus doubt, which, while meeting the tests for sentence negation, do not allow some-any suppletion or the occurrence of until-phrases in the subordinate clause:

- (81)(c) \*They don't doubt that she has ever been to Europe.  
 (d) \*They don't doubt that he will get here until noon.

That this is not a general property of double negation can be seen by comparing the sentences above with the following:

- (81)(e) He won't not pay taxes until he's convinced that it would have some effect on policy (will he?).

Thus it is not obvious that example (81.a) by itself argues conclusively against Klima's introducing the phrasal not in positions where subordinate clauses would be in construction with it, since there are apparently other unexplained factors involved.

There are some arguments for deriving the not of not long ago, not ten miles away, etc. from less than.

(i) In many instances, i.e. before a numeral (agreed to by everyone) and before long ago and far away (debatable) not seems to mean less than.

(ii) Before a numeral not can be replaced by less than.

(iii) Less than and not both occur in locative and point time adverbial measure phrases, but not in e.g.

- (82)\*Not in Boston he found the book.

(iv) Both not and less than can cooccur with sentence negation:

- (83) { Not  
       Less than } two weeks ago he didn't like any fruit.

There are even stronger arguments against such a derivation, however:

(i) In many cases, i.e. before long ago and far away, only not and not less than can occur.

(ii) To many speakers not means less than only when immediately preceding a numeral.

(iii) In support of (ii) it was noted that we could also get:

(84) Not quite 300 ft. away I found a dime.

where not  $\neq$  less than.

(iv) Not can cooccur with less than. The full range of adverbial phrases of this kind appears to be:

- (85)(a) Not 300 ft. away ...
- (b) Less than 300 ft. away ...
- (c) Not less than 300 ft. away ...
- (d) Not much less than 300 ft. away ...
- (e) Not very much less than 200 ft. away ...
- (f) Much less than 300 ft. away ...
- (g) Very much less than 300 ft. away ...
- (h) 300 ft. away ...
- (i) Not quite 300 ft. away ...

Not quite is a unit: quite cannot occur in such phrases without not. More than has the same distribution as less than.

In summary, the cooccurrence restrictions appear to be:

$$\left( \left( \begin{array}{l} \text{(not)((very) much) } \left\{ \begin{array}{l} \text{less than} \\ \text{more than} \end{array} \right\} \\ \text{not (quite)} \end{array} \right) \right) 300 \text{ ft. away ...}$$

There are further constraints on not when the measure phrase adverbial does not occur in presential position. That is, we do not have:

- (86)(a) \*She didn't like him not 2 days ago.
- (b) \*The race will start in not ten minutes.

If therefore this adverbial is generated following the VP, it must be obligatorily preposed if not rather than less than is chosen. If the adverbial is generated presententially, then it must be blocked from extraposing when not is chosen.

At present we have no suggestion for deriving these adverbials.

#### D. The Interpretive Approach: Jackendoff

Jackendoff (1968e) proposes a radically different approach to negation, namely that negatives are introduced in their full range of surface positions, with the relations that exist between sentences explained by semantic interpretation rules acting on derived structures. One of the main functions of the semantic rules in this case is to determine the "scope" of any occurrence of NEG in a sentence. Thus, for example, (87.a) and (87.b) are both generated by PS-rules, and an interpretive rule assigns VP-scope to the NEG of (87.a) and S-scope to the NEG of (87.b).

- (87)(a) Some of the men didn't see anything. [32]
- (b) None of the men saw anything. [33]

But he gives no indication of how the variability of scope might be limited to sentences containing indefinites: he would appear to be predicting an ambiguity in:

- (88) John didn't see the police car.

He gives no arguments against Fillmore's proposal for handling (87.a-b) by a feature [+ SPECIFIC], which appears to us to be quite convincing.

A crucial part of Jackendoff's argument is that the scope of negation is always a (continuous) constituent, i.e. that it is always associated with a particular node in the tree. But this would appear to be contradicted by such examples as:

- (89)(a) No one has found any solution to some of these problems.
- (b) I couldn't find some of the books I needed in any of the branch libraries, so I had to go downtown.
- (c) Mary supports John, not John Mary.
- (d) He didn't answer some of the questions.

These examples point to a difference in individual determiners, as suggested by Fillmore, rather than a global difference in scope. (They might be attributable to global differences in scope in a deep structure which had the quantifiers as predicates, along the lines suggested by Lakoff, but that is the kind of structure Jackendoff is trying to avoid.)

Some of the strongest arguments in favor of his position come from sentences with more than one negative in which the order of the constituents crucially affects the interpretation, e.g. (47.a-b) above and the following:

- (90)(a) Never before had any of his friends not come to one of his parties. [100]
- (b) Never before hadn't any of his friends come to one of his parties. [101]

As we stated in part C above, we have no way of accounting for this phenomenon; but we do not consider it sufficient justification for Jackendoff's position, given the counterarguments presented above.

#### E. Source of NEG with the One-NEG-per-S Approach

##### 1. Deep Structure Position of NEG

One of Klima's fundamental conclusions is that, except for double negation, all negative sentences should be accounted for on the basis of a single deep structure constituent NEG whose position in the base should be the same no matter what constituent its superficial reflex is associated with. Furthermore, his use of the concept "in construction with" (see section II.B.2. above) leads him to conclude that NEG must be immediately dominated by S in the deep structure. He gives some arguments for introducing it between subject and predicate, and some arguments for having it precede the subject, with the balance favoring the latter. His rule is stated above, (45). Before commenting in detail on his arguments, we will indicate some of the main features of Fillmore's treatment of this question and sketch roughly our own analysis; then we will consider together the arguments concerning deep structure position of NEG in the three analyses.

Fillmore also introduces not in sentence-initial position (preceded only by a question morpheme, as in Klima's analysis), but not immediately dominated by S. For Fillmore, not is simply one member of a lexical category NEG which includes also hardly, seldom,

scarcely, and which along with Pos(itive)(sometimes, often, ...) is an expansion of Preverb, which in turn is immediately dominated by S. His expansion of S is:

(91) S (Q)(Prev) NP Aux VP.

But Fillmore's reasons for introducing NEG in S-initial position are not the same as Klima's; we will discuss them shortly.

With the adoption of a case grammar, (Fillmore (1966d) did not use case grammar) the first rules expanding S change; the major break, instead of being between Subject and Predicate, or NP and VP, is between MOD(ality) and PROP(osition), the former including at least AUX and the latter including V and NP's in various cases. The various arguments for introducing NEG in S-initial vs. pre-AUX position then converge, since AUX itself is S-initial in the deep structure.

We turn now to the specific arguments relevant to the choice of deep structure position in Klima's, Fillmore's, and our analyses.

(i) In all three analyses, NEG is one of the elements which can trigger some-any suppletion. Since Klima uses the notion "in construction with" to define the scope of the some-any rule, NEG for him must be immediately dominated by S, if it is to trigger suppletion throughout that S. However, since the notion "in construction with" loses its advantages over the notion "command" with the present treatment of the verb phrase (see II.B.2.), and since the notion "command" does not require that S immediately dominate NEG, the latter requirement is no longer supported. Note that in Fillmore, NEG is dominated by PREV, and in this grammar it is dominated by MOD.

The some-any rule can be stated most simply if NEG precedes all the quantifiers at the time the rule applies. In Klima's and Fillmore's analyses, this is accomplished by having NEG start out sentence-initially, and move into AUX only after the some-any rule applies. In our grammar the analogous device is for subject-placement rules to follow some-any suppletion, NEG starting out and remaining in MOD.

(ii) In Klima's and Fillmore's analyses one of the arguments for S-initial NEG is the parallelism between NEG and the interrogative morpheme, WH or Q. Both trigger some-any suppletion and both trigger AUX-inversion; and for WH there are clear arguments (such as indirect questions with whether) for S-initial position. Jackendoff (1968f) also gives a number of arguments for the parallels between NEG and

WH, although he concludes that both are to be generated with NP's as well as in S-initial position.

However, there are certainly differences between WH and NEG. Katz and Postal (1964b), without making the comparison explicit, accept Klima's treatment of NEG (apparently unaware of the optionality of the meaning -changing some-any suppletion rule), but argue for quite a different treatment of WH. In particular, they note that a single deep structure WH would not provide the distinctions necessary to account for the following, no two of which are paraphrases:

- |                                  |      |
|----------------------------------|------|
| (92)(a) Did someone see someone? | [78] |
| (b) Who saw someone?             | [74] |
| (c) Who did someone see?         | [75] |
| (d) Who saw whom?                | [79] |

The claim implicit in their treatment, namely that a single deep-structure NEG would not have the same inadequacy, is a tricky one to verify or disconfirm. There are at least two differences that complicate the issue: (i) some-any suppletion with WH does not seem to affect meaning substantially, while with NEG it always does; and (ii) WH can incorporate into any indefinite item, whereas NEG can incorporate only into the first of several any-words. Thus we have to consider all of the following, some of which are ungrammatical in the NEG case. (The four above are repeated for convenience.)

- |                                  |
|----------------------------------|
| (92)(a) Did someone see someone? |
| (a') Someone didn't see someone. |
| (b) Who saw someone?             |
| (b') (?) Noone saw someone.      |
| (c) Who did someone see?         |
| (c') Someone saw noone.          |
| (d) Who saw whom?                |
| (d') Noone saw noone.            |
| (e) Did someone see anyone?      |
| (e') Someone didn't see anyone.  |
| (f) Did anyone see someone?      |
| (f') *Anyone didn't see someone. |
| (g) Did anyone see anyone?       |
| (g') *Anyone didn't see anyone.  |
| (h) Who saw anyone?              |
| (h') Noone saw anyone.           |
| (i) Who did anyone see?          |
| (i') *Anyone saw noone.          |



The lack of correspondence between the two sets, in terms both of meaning and of grammaticality, undoubtedly involves a number of factors such as (i) and (ii) above. But at least as far as semantics is concerned, the biggest differences in meaning in the WH set appear with the changes in position of the WH; (92.a,e,f,g) are all closer to each other in meaning than to any of the others in the set. For NEG, on the other hand, the biggest differences in meaning come with some-any suppletion, and incorporation of NEG into an any constituent does not affect the meaning: (92.e') is synonymous with (92.c') rather than with any of the other sentences in which NEG is located in the AUX.

Thus, while we would not support Katz' and Postal's position on NEG and WH fully (for divergence from Klima's treatment of NEG, see above; for alternative treatment of WH, see INTERROG), we would at least agree that NEG and WH have many important non-parallelisms. Note that even the two parallels most frequently cited are quite superficial on closer inspection: (a) both trigger some-any suppletion, but if we use the feature [+ SPECIFIC], the rule would appear to be obligatory for NEG but optional for WH; (b) both trigger Aux-inversion, but WH always stays in or moves to S-initial position (except for echo questions) and thus always leads to eventual Aux-inversion; NEG only does so when it ends up in a preposed adverb.

Thus, it would appear to us that the parallelisms between NEG and WH pointed to by Klima, Fillmore, and Jackendoff have not in fact been shown to be of a type best accounted for by sameness of deep structure position. The facts that both are [+AFFECT] and that both often end up in S-initial position could seem to be sufficient to explain the surface regularities in question.

(iii) One argument used only by Fillmore (implicitly) for the sentence-initial origin of NEG is that it would simplify the account of the following:

- (93)(a) Never had he seen such a marvelous device.
- (b) Hardly anyone believed him.
- (c) \*Hardly John believed him.
- (d) John hardly believed him.
- (e) Seldom has anyone performed so well.
- (f) \*Anyone has seldom performed so well.
- (g) Seldom has Sheila performed so well.
- (h) Sheila has seldom performed so well.

Fillmore has the negative preverbs originate S-initially, then move into AUX only if the subject is not an any-word (cf. 93.f); the movement then is obligatory for certain preverbs like hardly, (93.c-d),

optional for other such as seldom (93.g-h). He claims that the only ones which can remain in S-initial position are those which subsequently attract the AUX, and thus he will not generate:

(94)(a) Usually John drinks his coffee black.

He does not relate the positioning of the preverbs to the positioning of larger adverbs of similar types. Thus while (94.b) may be preferable to (94.a), (94.c) is preferable to (94.d), and this is not accounted for in Fillmore's system.

(94)(b) John usually drinks his coffee black.

(c) On weekdays John drinks his coffee black.

(d) (\*) John on weekdays drinks his coffee black.

We suggest in the next section that such facts are better accounted for if adverbs are classified primarily by function, with the possibility of occurrence in preverb position simply indicated by a feature [+PREVERB].

Another problem that arises from Fillmore's use of the S-initial position of preverbs to account for (93) stems from his separation of the any-no rule from the rule for positioning the preverbs other than NEG. The problem is that hardly, since it is not included in the any-no rule, can end up only in S-initial position or in the AUX. Thus, Fillmore generates all of (95) and none of (96).

(95)(a) \*Hardly the authors of any of the books objected.

(b) (?) John hardly told the story to anyone.

(c) (?) He has hardly had anything to eat for the last three weeks.

(96)(a) The authors of hardly any of the books objected.

(b) (?) John told the story to hardly anyone.

(c) He had had hardly anything to eat for the last three weeks.

Although the data are not clear cut, it would appear to us that at least as good results can be gotten by having the NEG and all the negative preverbs in pre-AUX position when adverb-preposing applies, and later positioning both NEG and the hardly-type preverbs by an extension of the any-no rule. Our main arguments for discarding part of Fillmore's analysis of preverbs is in the next section, however, so our rejection of this argument for S-initial NEG position rests heavily in arguments to be found below.

(iv) One of Klima's arguments for S-initial NEG comes from sentences like

- (97)(a) The old people wanted to remain, but not the young people. [177.a]
- (b) Mary can come in, but not anybody else. [177.d]
- (c) Mary supports John, not John, Mary. [177.c]

However, this phenomenon seems to be a matter of special NEG-attraction to adversative conjunctions rather than a reflection of the deep structure position of NEG. Note the non-standard position of NEG in the following (and cf. CONJ):

- (98)(a) I saw John but not Bill.
- (b) I saw not John but Bill.
- (c) I gave it not to John but to Bill.

(v) Another of Klima's arguments for an S-initial for NEG is to keep the structure of a sentential NEG with a preposed adverb separate from that of constituent NEG, in order to correctly predict AUX-inversion. That is, the following must have distinct structures at the time AUX-attraction applies:

- (99)(a) Not even two years ago was I there. [175.a]
- (b) Not even two years ago I was there. [175.b]
- (100)(a) In not many years will Christmas fall on Sunday. [176.b]

However, it is clear from the position of not in the prepositional phrase in (100) that it cannot still be dominated directly by S. Thus although it is not clear how the difference should be represented, the S-initial position postulated as the source of NEG does not seem sufficient.

In summary, while we have no strong arguments against a sentence-initial deep structure for NEG, we reject most of the specific arguments that have been advanced for it. In the next section we argue for a uniform treatment of not, hardly, scarcely, barely, all as NEG, contrasting with others of Fillmore's negative preverbs. We generate NEG in the MOD constituent, with the only positive argument for that position being simplification of the some-any rule, certainly a very weak argument. We thus regard the deep structure position of NEG as very much an open question, particularly with respect to any parallelism with WH.

## 2. Preverbs.

Fillmore introduces preverbs under category labels POS and NEG, with cross-classified features [+TEMPORAL]. He then has to make the inelegant restriction that POS and NEG cooccur only if either NEG is not or POS is ever. (The other POS's include sometimes, often, always, usually; other NEG's are never, rarely, seldom, barely, hardly, scarcely.)

Klima reserves NEG for not (and resultant combined n-forms), and introduces Fillmore's negative preverbs as cooccurring with N., rather than as alternative rewrites of it.

It seems intuitively that some of the preverbs are just temporal adverbs (mainly frequency), and that hardly, barely, scarcely (and not, of course) are something else. But just what these latter are is much less clear.

Items which can occur in preverbal position include:

obviously, probably, finally, thus, actually, really,  
therefore, still, apparently, certainly, nevertheless

Obviously, "preverb" is not a syntactic category: it comes closer to being a feature shared by all one-word sentence adverbs. Let us then assume that there is a feature [+PREVERB] associated with those items in the lexicon. Most of them belong to categories which also contain non-preverbs; and most of them, when cooccurring with not in preverb position, must precede the not. The fact that this last generalization fails for sometimes, often, usually, actually, and really has to be left as part of the unsolved area of interacting NEG and ADV and double negation.

The preverbs which seem to need the most explaining are barely, hardly, and scarcely, all negative but not obviously members of a class which includes corresponding positive members. For Klima they occur only in the environment of NEG, which they later "incorporate". For Fillmore they form the class of non-temporal negative preverbs whose only other member is not. Neither has suggested any related positive elements.

Both Klima's and Fillmore's analyses have problems with the rules for sentence-initial adverb placement and attraction of NEG to any-words, precisely because of the behavior of the "negative preverbs". There are similar problems in the analysis used in the NEG report of UESP (1967); cf. pp. 19, 22 of that report.

(1) The worst thing is that the adverb placement rule could be made completely optional and completely independent of negation except for the fact that if the adverb is seldom or rarely and the subject of the sentence is indeterminate (i.e. an any-word), the adverb must prepose. Fillmore manages to capture the restriction but does not generalize adverb-preposing beyond the preverbs; Klima is vague about environments although apparently aware of the problem. The rule in UESP (1967) was stated in quite general terms, with an unpleasant restriction of the above form appended.

(2) The NEG-attraction rule must be stated as applying to not and to the non-temporal negative preverbs hardly, barely, scarcely, but not to the temporal negative preverbs, an ad hoc restriction if "preverbs" are a natural class.

A new approach is suggested by the synonymy of the following sentences:

- (101)(a) Hardly anyone ever buys turnips.
- (b) Hardly ever does anyone buy turnips.
- (c) Seldom does anyone buy turnips.

Sentences (101.a) and (101.b) are analogous to (102.a) and (102.b):

- (102)(a) No one ever buys turnips.
- (b) Never does anyone buy turnips.

The problem with previous analyses was to generate (101.c) while excluding (103):

- (103) \*Anyone seldom buys turnips.

If it were not for (103), the adverb-preposing rule could be perfectly optional. But it still can be if we analyze seldom as a surface form of hardly ever. (From here on, we assume incorrectly that hardly, barely, scarcely are just stylistic variants of each other, and likewise seldom, rarely.) Then it is only the ever which is optionally moved by adverb-preposing, and the hardly is then attached (as in NEG) to the leftmost constituent. Thus (103) is automatically excluded, because if ever is not preposed, hardly must attach to anyone, giving (101.a).

This solution has two further advantages. Because seldom would no longer be a negative preverb in deep structure, we can adopt a Fillmore-like derivation of hardly as a possible rewrite of NEG and completely do away with Klima's rule of NEG-incorporation for "incomplete



negatives". Not and hardly will share the category NEG and differ by some feature we might call [+COMPLETE] or the like, a feature we can use to control e.g. neither-tag formation.

(104) \*John hardly ever sleeps late and neither does Bill.

Secondly, the NEG-attachment rule, which used to apply to NEG and to non-temporal negative preverbs, now applies simply to NEG.

Thus all the major problems connected with the preverbs appear to be simultaneously solved.

F. Too, Either and Neither.

Overview. Following Klima, we consider too-either alternation essentially the same process as some-any alternation, and either-neither a case of any-no suppletion. It then turns out that except for one small problem (the absence of neither in final position), a proper choice of assumptions about the structure of too in conjunctions yields all the grammatical forms without any new rules.

Too-conjunction. Since too is not currently generated by the conjunction rules, a word about it is in order here.

Firstly, we will ignore single sentences containing too, such as:

(105) John likes meat, too.

Such sentences are certainly possible in a discourse, but so are "Neither did I", "But I can't", and "Not him, him", and it is not clear where to draw the line.

Considering only two-sentence conjunctions, we find that the possibility of too in the second sentence depends on a semantic distinction which we might call "addition" vs. "contrast":

addition:

(106) Peter left, and Bill left, too.

(107) John likes Mary, and he likes Susan, too.

(108) John didn't leave until 3 AM, and Mary stayed late, too.



- (109) The Orioles have lost all their games against the Tigers, and the Red Sox were beating them, too.

contrast:

- (110) \*Peter left, and Bill stayed, too.  
 (111) \*John likes Mary, and he dislikes Susan, too.  
 (112) \*John left at 3 AM, and Mary arrived at 4 o'clock, too.  
 (113) \*The Orioles beat the Tigers, and were beaten by the Red Sox, too.

In examples (110)-(113), deletion of too makes the sentence grammatical; furthermore, the sentences are all positive, so the impossibility of too here has nothing to do with negation. Examples (108) and (109) show that formal identity is not the deciding factor. Example (108) shows further that even verb phrase synonymy is not required, since in (108) Mary may have left at 2 AM or 4 AM (although stating such a time explicitly would disallow too).

The non-syntactic nature of the distinction is particularly clear in the following sentence, where whether too is appropriate or not is certainly not up to the grammar:

- (114) John left at 3 AM, and Mary left early (too).

Since the occurrence of too in a conjoined sentence is not syntactically conditioned, we must apparently generate it either in all conjunctions or in none of them. Since the derivation from too to either to neither is syntactically perfectly regular, we prefer to assume that too-conjunctions (presumably with (110)-(113) included) are being generated, and to carry on the derivation from there, even though there is no account of too-conjunction in CONJ.

Too-either. Two assumptions about too are necessary in order for the some-any rule to be able to convert it to either.

(i) Too must be [-SPECIFIC]<sup>1</sup>, since it always changes to either when under the influence of negation.

---

<sup>1</sup> It appears that there is also a [+SPECIFIC] too, but it never appears in addition-type and-conjunction. We have no suggestions about it.

- (n1) I gave him a necktie last year; I can't give him a necktie this year too. (\*either)

- (115)(a) John refused the package, and Mary wouldn't accept it either.  
 (b) (\*) I think it is a brownie, but I'm not quite certain; Nanny isn't certain, too.  
 (A.A. Milne)

(ii) Too must be a constituent of the conjunct sentence it appears at the end of, in order for a NEG in just that sentence to command it.

Given these assumptions, the some-any rule will automatically account for the too-either alternation.

Neither. At this point we need a third assumption about too, namely that it is a sentence adverb. With this assumption it will be subject to the general adverb-preposing rule to give us neither-tags without any new rules. A typical derivation would involve a large number of the (independently needed) negation rules, and would go roughly as follows:

- (116)(a) NEG John will eat liver and <sub>S</sub>[NEG Bill will eat liver too ]  
 [-SPEC]

⇒ by T some-any (oblig)

- (b) NEG John ... and <sub>S</sub>[NEG Bill will eat liver either]  
 [-SPEC]  
 [+INDET]

⇒ by Truncation (not included here) (opt)

- (c) NEG John ... and <sub>S</sub>[NEG Bill will either]

⇒ by ADV-preposing (opt)

- (d) NEG John ... and <sub>S</sub>[NEG <sub>ADV</sub>[either] Bill will]

⇒ by Preliminary Neg Placement (oblig)

---

(n2) He hears that from his wife every day; don't you start nagging him too. (\*either)

(n3) They already have 10 linguists; I'm sure I shouldn't go too. (\*either)

(e) John NEG will eat liver and S[either Bill NEG will]

⇒ by NEG-Attract to indeterminates (oblig)

(f) John NEG will eat liver and S[ ADV[NEG either]  
Bill will]

⇒ by Any-No Suppletion (oblig)

(g) John NEG will eat liver and S[ ADV[neither] Bill  
will] 

- SPEC
+ INDET
+ NEG

⇒ by Preverbal Particle  
Placement (oblig)

(h) John will NEG eat liver and ...

⇒ by S-Initial Aux-attraction (oblig)

(i) John will NEG eat liver and S[ ADV[neither]  
will Bill]

There are two problems remaining, however:

1. Too in its positive form does not prepose. Perhaps we can justify calling too and so conditioned alternants, however. Also is another apparently related item, and is the most freely movable of the set.

2. The any-no rule could optionally apply to an either which had optionally stayed in sentence-final position to give a sentence-final neither:

(117) \*John didn't leave, and Bill left neither.

Klima notes (p.320) that the either should therefore not be considered a constituent of the clause it appears at the end of. But it must be a constituent of that clause for the some-any rule to have derived it from too at an earlier stage, and for the adverb-preposing rule optionally to move it to sentence-initial position. There is no independent motivation for moving it out of that S (without changing its surface position, furthermore) part way through the derivation. It would be possible to prevent T Neg-Attract from applying to it, of course, but only by an ad hoc condition on the rule.

Fillmore's suggestion is that any-no suppletion precedes neither-fronting, with the latter obligatory. But the neither-fronting could not then be accomplished by the ordinary adverb-fronting rule, which must precede any-no suppletion to account for the fact that there are initial indeterminate ones:

(118) Sometimes he goes to movies on weekdays.

(119) Never does he go to movies on weekdays.

(120) \*Ever { he doesn't } go to movies on weekdays.  
              { doesn't he }

But it may be correct that neither-fronting is unrelated to adverb-fronting, since too-fronting is possible only if we can justify regarding so as a variant of too.

We therefore tentatively treat neither-fronting as adverb-fronting and simply add an ad hoc condition to part b of T NEG-ATTRACT to prevent sentence-final either from becoming neither:

Restriction 4: 4 ≠ either

### III. TRANSFORMATIONAL RULES

#### A. Rules

##### 1. SOME-ANY Suppletion (Obligatory)

S.I.	X	-	[+AFFECT]	-	X	-	<div style="display: inline-block; vertical-align: middle; text-align: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px;">-SPEC</div>  <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px;">-INDET</div> </div>	-	X
	1		2		3		4		5

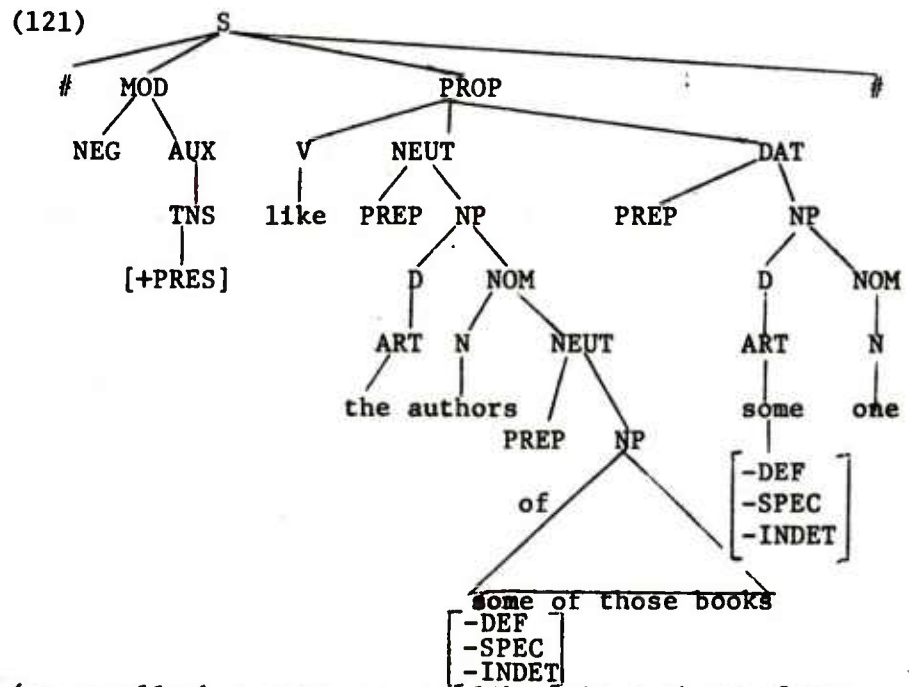
Conditions:

(i) 2 commands 4 (see II.B.2)

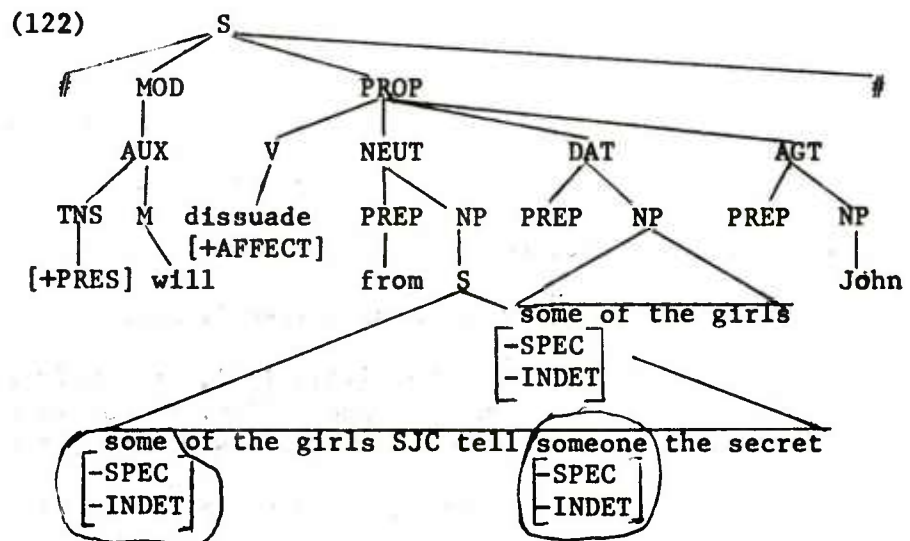
(ii) If 2 is [+N], [+V], or [+PREP], then 4 does not command 2 (i.e. is not in the same simplex) and  $3 - 4 - 5 =_S [X - 4 - X] - X$

(iii) (Complex-NP constraint holds)

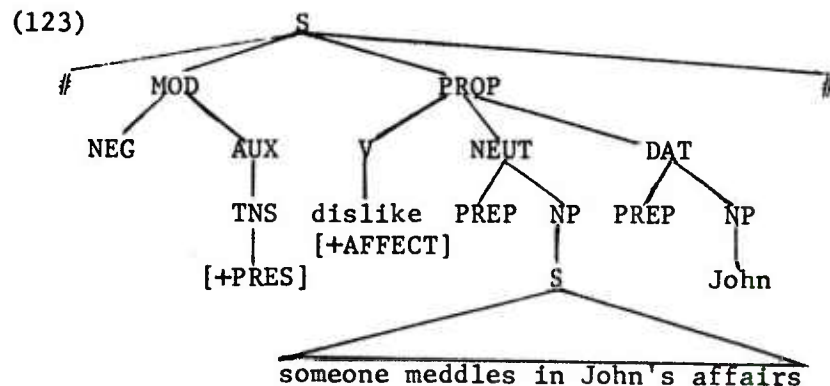
S.C. (1) Change [-INDET] to [+INDET] in 4

Tree examples

(eventually becomes: no one likes the authors of any of those books.)



(→ John will dissuade some of the girls from telling anyone the secret [only the circled constituents change])



(⇒ John dislikes anyone meddling in his affairs)

### Examples

#### (a) Grammatical and generated

(124) John dislikes anyone meddling in his affairs.  
 (Where someone meddling in John's affairs is all the direct object of dislike; if someone had been the direct object of dislike, it would not have changed to anyone; cf. tree (122) above.)

(125) John doubted that anyone would ever believe him.

(126) John is afraid { to trust } anyone with his  
                                   of trusting  
 secret.  
 (afraid of must be [+AFFECT] while afraid that is [-AFFECT]. We assume that afraid to derives from afraid of to.)

(127) Scarcely anybody believed that we would ever find anyone there.

(128) If anyone drives carelessly, someone suffers.  
 (If, when, before are all [+AFFECT].)

(129) His doubt that anyone will recognize him is gnawing at him.



- (130) He dislikes not doing anything.  
 (OPT  $\Rightarrow$  He dislikes doing nothing)  
 (From NEG in constituent sentence; [+AFFECT] in matrix which could have triggered it on next cycle doesn't because any has already been marked [+INDET].)
- (131) Not many of the students came on time.  
 (All this rule actually does is mark the [-SPECIFIC] indefinite article with many as [+INDET]; the Neg-attraction rule then obligatorily moves NEG to precede many. If the indefinite article with many had been [+SPECIFIC], we would get (136) below.)
- (132) John never works hard.  
 (This has an underlying presentence NEG and [-SPECIFIC] sometimes, which by this rule is changed to ever, and later incorporates the NEG. See (137) for contrast.)

(b) Grammatical but not generated by this rule

- (133) Anyone can become President. (It is conceivable that generic any might be marked [-DEF, -SPECIFIC, +INDET] in the base, but that is not being explored here.)
- (134) Only then did anyone realize that anything was wrong. (Certain only's should be [+AFFECT], but it is not clear how to distinguish them from the ones which are not: \*John only bruised one of the boys.)
- (135) John hadn't read some of the important articles. (This is [+SPECIFIC] some)
- (136) Many of the students didn't come on time. (See (131) above)
- (137) John sometimes doesn't work hard. (see (132) above.)
- (138) Everybody around here who ever buys anything on credit talks in his sleep. (By some-any Rel suppletion; cf. (40) above)

(c) Ungrammatical, not generated

- (139) \*John doubted anything. (There is no sentence NEG; although doubt is [+AFFECT], something is not in an embedded S.)
- (140) \*John is afraid that he might say anything indiscreet to her. (see (126))
- (141) \*After he drank any beer, he left. (Before is [+AFFECT], after is [-AFFECT]. It may be that every item which can occur before an S "complement" must be marked in the lexicon as [+AFFECT] or [-AFFECT].)

2. SOME-ANY REL Suppletion (Obligatory)

This is the special rule for some-any suppletion in relative clauses, proposed by Ross (not in exactly this form): see discussion in II.B.2.

$$S. I. \quad X \text{ NP} \left[ {}_D \left\{ \begin{array}{l} X [+AFFECT'] \\ X [+INDET] \end{array} \right\} X \right] \text{ NOM} \left[ \text{NOM} \text{ S} \left[ \begin{array}{c} X \left[ \begin{array}{c} -\text{SPEC} \\ -\text{INDET} \end{array} \right] X \end{array} \right] \right] X \right]$$

1                      2

Condition: 1 is the lowest S dominating 2

S. C. Change [-INDET] to [+INDET] in 2

Notes:

1. [+AFFECT'] is a feature being used to mark a, every, all, the first, the last, the Adj+est, the only. No and any qualify by being [+INDET].
2. The rule may apply to its own output.

Examples

Grammatical: cf. (40), (42), (43).

Ungrammatical, excluded: cf. (29), (41).

### 3. S-Initial ADV Placement (Optional)

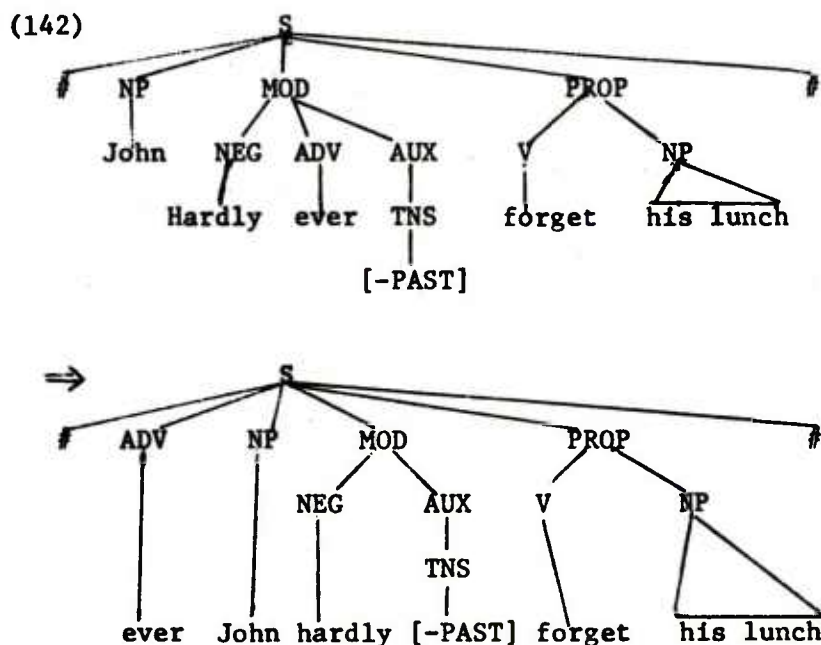
S.I.	#	NP	MOD	X	ADV	AUX	]	X
	1				2			

S.C. 1. Attach 2 as right sister of 1.  
2. Erase 2.

(1) This rule moves any sentence adverb, including so-called "temporal preverbs," to the front of the sentence. To avoid complication, only one adverb may be moved. Further details are ignored.

(2) We have not included emphatic inversion, which need not involve sentence ADV, e.g. of you I think nothing.

### Tree Examples:



Examples

A. Grammatical (or stages in grammatical sentences)

- (143) Ever John hardly forgets his lunch (NEG-attraction followed by AUX-attraction will give Hardly ever does John ..., which may then become Seldom does John ...; see sentences (146), (149) below.)
- (144) Often John doesn't forget his lunch (if this often is [+SPECIFIC] no further changes will occur; if it is [-SPECIFIC] it will be subject to Neg-incorporation which in turn will trigger AUX-attraction, giving Not often does John forget his lunch. Contrary to Fillmore's claim, often by itself does not generally trigger AUX-attraction: \*often does John(not) forget his lunch.)
- (145) In England horse-racing is respectable.
- (146) In any other country women are not such slaves. (neg-incorporation and Aux-attraction will give In no other country are women such slaves.)
- (147) Women are not such slaves in any other country. (The rule is optional; this sentence results from not applying it.)
- (148) Sometimes he doesn't fall asleep easily. (No further changes)
- (149) Ever he doesn't fall asleep easily. (NEG-incorporation and AUX-attraction will give Never does he fall asleep easily.)
- (150) Seldom anyone has been there.

B. Ungrammatical, not generated

- (151) \*Hardly John likes Mary. (Only ADV can be preposed; hardly is NEG)
- (152) \*For three hours the play lasted. (Only sentence adverbs can be preposed.)

## C. Grammatical, not generated by this rule

(153) Hardly anybody likes Mary. (This is analyzed as NEG-attraction into the indeterminate anybody, not as adverb-preposing.)

4. NEG-Attraction (Partly Optional)

## a. (obligatory)

Structure Index

X - [+INDET] (QUANT) - X - NEG - X  
 1                      2                      3      4      5

Conditions:

1. If 4 = ADVB, then 2 ≠ [-HARDLY] + X
2. 1 ≠ X - [+INDET] - X

Structure Change

1-2-3-4-5 ⇒ 1 - 4 + 2 - 3 - ∅ - 5

## b. (optional)

Structure Index

X -            NEG            - X - [+INDET] - X  
 1            2            3            4            5

Conditions

1. 3 ≠ X - [+INDET] - X
2. 5 ≠ QUANT - X

Structure Change

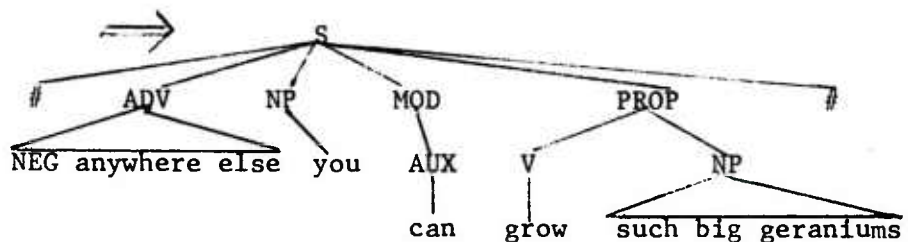
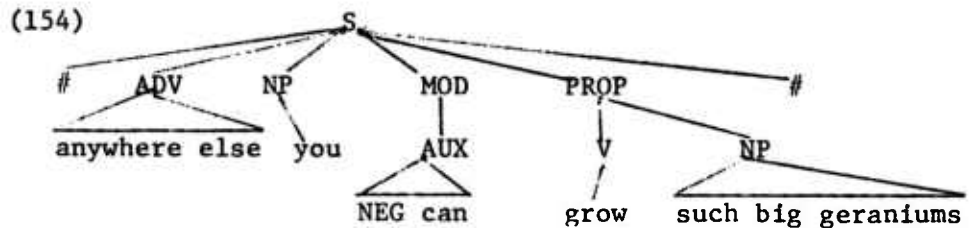
1 - 2 - 3 - 4 ⇒ 1 - ∅ - 3 - 2 + 4 - 5

Notes

1. The feature [+HARDLY] is an ad hoc device to distinguish those quantifiers modifiable by negative preverbs, e.g. hardly three, hardly any, hardly a dozen, from those that are not, e.g. \*hardly many, hardly all.

2. QUANT must be included in the obligatory part of the rule but omitted from the optional part to account correctly for sentences (155.g), (156.d) and (157.c-d) below.

Tree examples:



Examples

A. Grammatical (or stages in the derivation of grammatical sentences)

- (155) (a) Scarcely anyone showed up.  
 (b) Not anyone showed up. ( $\Rightarrow$  No one ... by next rule)  
 (c) Barely a hundred people voted Socialist.  
 (d) Hardly anywhere else can you find so many green houses.  
 (e) John was finding mushrooms not anywhere.  
 ( $\Rightarrow$  nowhere)  
 (f) John spoke to scarcely a dozen people.  
 (g) Not three of the people showed up.

B. Ungrammatical

- (156) (a) \*Anyone had scarcely anything to say.  
 (b) \*Hardly many people came to the party.  
 (c) \*Anyone isn't down there.  
 (d) \*He answered not three of the questions.  
 (e) \*He spoke to anyone nowhere.  
 (f) \*He saw not many people there.



## C. Grammatical, but not from this rule

- (157)(a) John has hardly seen any of California.  
 (Optional part not applied; pre-verbal placement then obligatorily applies.)
- (b) Not many years ago there was a wilderness here. (source for this negative so far undetermined.)
- (c) Three of the people didn't show up. ([-INDET])
- (d) He didn't answer three of the questions.  
 (Ambiguously [+INDET])
- (e) He saw few people there. (see note 4 below)

## JUSTIFICATION

1. Fillmore collapses this rule together with the following any-no suppletion rule, adding negative directly as a feature to the first following indeterminate determiner, obligatorily if it precedes tense, optionally, otherwise. (Recall that his negative starts out in pre-sentence position.) Thus for him example (155.a) and (155.d) are unrelated; it appears that he does not generate (155.d) at all. (155.a) is taken to be the preverb remaining in its sentence-initial position (rather than moving inside the NP as in our analysis). (155.e) and (155.f) are not related by him either; (155.f) appears not to be generated.

2. Klima notes that "negative pre-verbal adverbs like scarcely occur obligatorily attached to the first indefinite in Pre-Tense position" (p. 272); but his rule of neg-incorporation into indefinites does not apply to scarcely, etc., because the rule applies to neg, which has previously been absorbed by the incomplete negatives scarcely, etc.; this is probably an oversight. In other respects our rule is essentially Klima's; note that he has moved neg into pre-Tense position before this rule applies.

3. This treatment allows adverb-preposing and negative attraction both to be made fully general instead of having a special rule for preposing adverbs containing negatives.

4. Note that since we exclude example (156.f) above, we cannot derive few in (157.e) from not many, as has sometimes been advocated. But if we argue that few should never be derived from not many anyhow, this would not be a defect in the rule. And we can so argue, on a number of grounds.

(i) Very few is certainly not synonymous with not very many, and \*very not many does not exist.

(ii) There is considerable difference in the acceptability of the tags in the following:

- (158)(a) Not many people live there, do they?
- (b) \*Not many people live there, don't they?
- (c) ?Few people live there, do they?
- (d) ?Few people live there, don't they?

(iii) All the properties of few which are shared by not many, primarily some-any suppletion and Aux-attraction, are also shared by only a few, which is at least as good a paraphrase of few as not many is and which furthermore patterns like few in respects (i) and (ii), above.

- (159)(a) only a few few = very few
- (b) ?Only a few people live there { do they?  
don't they? }
- (c) Only a few people ever saw anything there.
- (d) In only a few countries do people drive on the left.

These factors suggest that few is better derived from only a few (a suggestion due to Elinor Charney (M.I.T. Seminar talk, 1962)) than from not many. The question is far from settled, however, since for many speakers (158.c) is preferred to (158.d), but the second alternative of (159.b) to the first.

##### 5. ANY-NO Suppletion (Partly Optional)

###### Structure Index

X - NEG -  $\begin{bmatrix} -\text{DEF} \\ +\text{INDET} \end{bmatrix}$  - X

[+COMPLETE]

1        2                    3                    4

###### Structure Change

1 -  $\emptyset$  -  $\begin{bmatrix} 3 \\ +\text{NEG} \end{bmatrix}$  - 4

Optional if 3 dominates ever and 1 ≠ #; obligatory otherwise

## Examples

### A. Grammatical

- (160)(a) No one knows anything about it.  
 (b) John never goes to the store. (option taken;  
 negative pre-verbal particle placement blocks)  
 (c) Never does John go to the store. (oblig  
 since 1 = #)

### B. Ungrammatical

- (161)(a) \*Not anyone knows anything about it.  
 (b) \*John does never go to the store. (If this  
 rule came after, or could be applied after,  
 pre-verbal particle placement, this sentence  
 would be generated.)  
 (c) \*Not ever does John go to the store.

### C. Grammatical, not generated by this rule

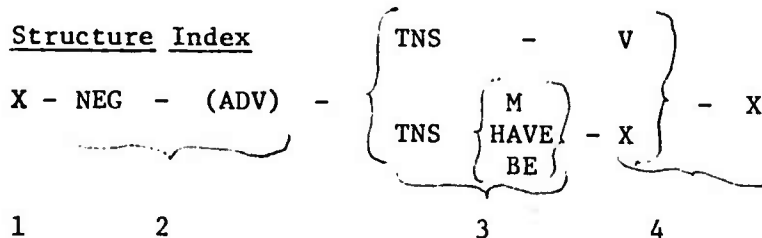
- (162)(a) Not many people came. (Does not apply  
 because NEG not adjacent to [+INDET] which  
 is on the (eventually deleted) article.)  
 (b) John doesn't ever go to the store. (Optional  
 variant of (160.b) gotten by not taking the  
 option in this rule and hence obligatorily  
 applying preverbal particle placement.)

## JUSTIFICATION

1. The rule is optional for not ever - never so as to allow the alternation between "doesn't ever go" and "never goes". Klima and Fillmore both take account of this, Fillmore by a separate rule for never, Klima by a distinction between the order ever neg and neg ever.

2. It is not necessary to add the feature [+ATTRACT] to never, as Fillmore does, because Aux-attraction is triggered by the [+NEG] feature anyway.

## 6. Preverbal Particle Placement (Obligatory)



## Structure Change

$$1 - 0 - 3 + 2 - 4$$

## Examples

### A. Grammatical

- (163) (a) John didn't often visit his mother  
(contraction is actually later)  
(b) John hasn't often visited his mother  
(c) John hasn't ever seen the ocean  
(d) John can't swim

### B. Ungrammatical

- (164) (a) \*John did never go home  
(b) \*John not has (ever) seen the ocean  
(c) \*John not (really) likes Mary

C. Grammatical, not this rule

- (165) (a) John has never seen the sea  
(b) John has often dreamed of it  
(c) John never saw them  
(d) John hardly recognized his own mother  
(e) John often has not paid taxes (would be generated by this rule if often not were generated at all)  
(f) John has often not paid taxes (if often not were generated at all, this would be a case of applying this rule to move NEG and the following rule to move often)

## 7. Preverbal ADV Placement (Optional)

<u>Structure</u>		<u>Index</u>			
X	- ADV	-	TNS	<div><div>M</div><div>HAVE</div><div>BE</div></div>	- X
1	2	3		4	

Structure Change

1 - Ø - 3 + 2 - 4

Notes

1. This rule differs from pre-verbal particle placement in two ways; this rule is optional, and it requires a full helping verb, not just TNS alone. The previous rule applies to NEG with an optionally following adverb, this rule to any preverbal adverb. Both rules are Klima's. Fillmore erroneously requires a full helping verb in the preceding case as well.

Examples

## A. Grammatical

- (166)(a) John has never seen the sea  
 (b) John has often dreamed of it  
 (c) You would hardly recognize him  
 (d) Henry has rarely been late  
 (e) George will probably have been drinking again

## B. Ungrammatical

- (167)(a) \*John does never go home  
 (b) \*John did often dream of it

## C. Grammatical, not this rule

- (168)(a) John has not ever seen the sea  
 (b) John did not do it  
 (c) She has not often come on time (by previous rule)  
 (d) Barking dogs never bite  
 (e) John hardly recognized his own mother  
 (f) She has often not come on time (see note to (165.f) with the preceding rule)

### 8. S-Initial AUX Attraction (Obligatory)

S.I.

$$\begin{array}{cccccccccccc}
 (S \text{ CONJ}) * \# \left\{ \begin{array}{c} \text{ADV} \\ \text{NP} \end{array} \right\} [ X \left\{ \begin{array}{c} [+WH] \\ [+NEG] \end{array} \right\} X ] X \text{ TNS } \left( \left\{ \begin{array}{c} M \\ \text{HAVE} \\ \text{BE} \end{array} \right\} \right) (\text{NEG}) (\text{ADV}) X \# \\
 1 \qquad 2 \quad 3 \qquad \qquad \qquad 4 \quad 5 \qquad \qquad 6 \qquad \qquad 7 \qquad 8 \quad 9 \quad 10
 \end{array}$$

S.C. 1. Add 567 as right sisters of 3

2. Delete 567

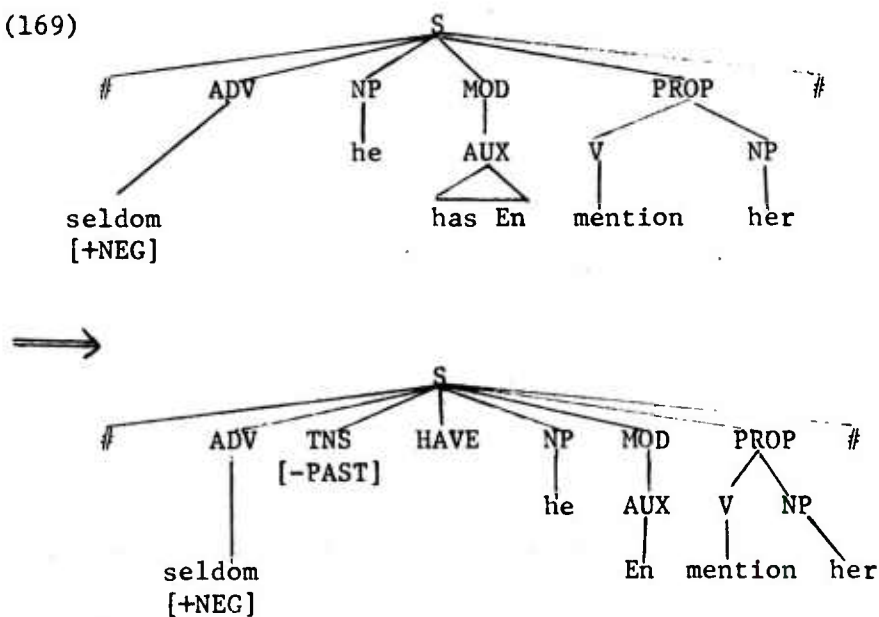
Conditions: 1. If 6 is null,  $9 = \begin{bmatrix} +V \\ -BE \end{bmatrix} + X$

2. The rule applies last-cyclically

Notes: see same rule in INTERROG

## Tree Example

(169)





Examples

## A. Grammatical

- (170)(a) Hardly ever is he late. (by SOME-ANY suppletion, NEG INCORP, S-INIT.ADV placement, NEG ATTRACT, AUX ATTRACT)  
 (b) Never have I seen a more beautiful day. (SOME-ANY, S-INIT ADV. NEG ATTRACT, ANY-NO, AUX-ATTRACT)  
 (c) In not many years does Christmas fall on Sunday.  
 (d) Seldom has he mentioned her. (S-INIT ADV, AUX ATTRACT)  
 (e) Did he leave?

## B. Ungrammatical

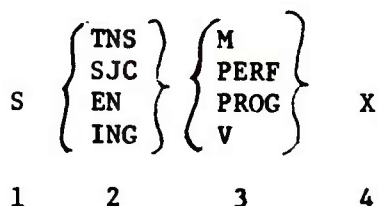
- (171)(a) \*Never I have seen a more beautiful day.  
 (b) \*Yesterday did he come.

## C. Grammatical, but not by this rule

- (172)(a) Only then did he recognize her. (not generated by our grammar at all)  
 (b) Were he to come, ... (not generated by our grammar at all)

## 9. Affix Shift (Obligatory)

S.I.

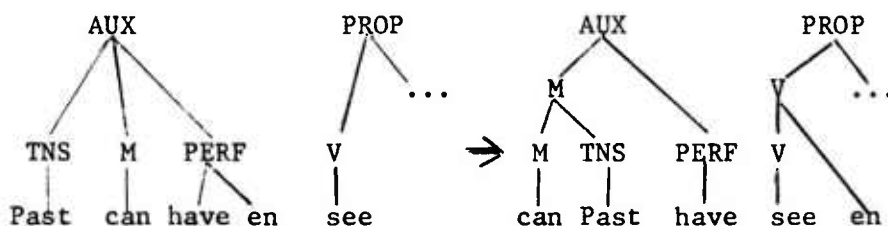


S.C. 2 Chomsky-adjoin to the right of 3; erase 2.

This rule must be applied simultaneously to all applicable constituents; if it were simply reapplied to its own output, all the affixes would end up on the main verb stem. The rule must be last-cyclic, applying to all levels of the tree. This is because all embedding rules which deform AUX require deep structure AUX's for input and introduce new stems and affixes in their output; hence the embedded AUX must not have undergone AFFIX Shift on its own cycle.

Tree Example

(173)

Notes:

Perhaps constituents 2 and 3 should simply mention the features "Af" and "V", as was done informally in e.g. Chomsky (1958). However, the saving would be small, particularly since there are transformationally introduced occurrences of PERF (see NOM).

10. DO-Support (Obligatory)

$$\begin{array}{ccccc} \text{S.I.} & & \text{X} & \left\{ \begin{array}{c} \text{TNS} \\ \text{SJC} \end{array} \right\} & \text{X} \\ & & 1 & 2 & 3 \end{array}$$

Condition: 2 not dom by M, PERF, PROG, or V

$$(\text{equivalently: } 1 \neq \text{X} + \left\{ \begin{array}{c} \text{M} \\ \text{V} \\ \text{have} \\ \text{be} \end{array} \right\} )$$

S.C. Add do as left sister of 2.

Notes:

1. We cannot use Chomsky adjunction here, since that would duplicate the TNS node, rather than some stem node.
2. This rule as it stands is not ideal, since it gives a very different derived structure from that obtained by affix-shift; in particular it gives very different structures to helping do and main verb do.

3. Chomsky (1958) has an ad hoc rule of word-boundary placement following affix-shifting and preceding do-support; do then comes in if and only if TNS is a word. Fillmore (1966d) uses the same rules. The above rule is similar, but recognizes the Chomsky-adjoined structure produced by the previous rule rather than doing anything with word boundaries.

4. Rosenbaum and Lochak (1966) expand AUX in the PS rules into just T (M); have + en and be + ing are introduced as constituents of VP. A have or be following T is attracted into the AUX before any of the rules which refer to the "first part of the AUX", i.e. simply AUX in their grammar. The AUX node is retained in all questions, etc. Then do-insertion applies simply if, after affix-shifting, T is the first constituent of AUX. This works very neatly.

5. Klima (1965) states in prose that do is inserted if after affix-shifting, TNS is still not attached to anything. Orally in 1967, however, he suggested that do is present in every deep structure, and is replaced by the first element after it if that is not a main verb. (This would also result in a single analysis for the "first part of aux", which would be desirable in its own right.) One possibly undesirable consequence of his proposal is that the presence of do would then be the normal case and its absence due to transformational replacement; this is at odds with the widespread belief that semantically empty things should not be in the deep structure.

# 11. NEG - Contraction

S.I.	X	$\left\{ \begin{array}{c} \text{TNS} \\ \text{SJC} \end{array} \right\}$	NEG	$\left\{ \begin{array}{c} [+V] \\ \text{NP} \end{array} \right\}$	X
	1	2	3	4	5

S.C. Add [+CNTR] to 3.

Conditions: Obligatory if 4 = NP; optional otherwise.

## Notes

1. The rule mentions SJC as well as TNS in order to include imperatives.

2. This rule precedes verbal ellipsis in order to account for (174.d-g), (175.a-b), (176.a, c-e).

3. The rule is obligatory when 4 = NP in order to account for (174.c) vs. (175.d). An alternative approach would be to have this rule precede AUX-attraction and make AUX-attraction dependent on its having applied.

### Examples

#### A. Grammatical, generated by this rule

- (174)(a) John hasn't seen the doctor yet.
- (b) He couldn't have left yet.
- (c) Isn't he going?
- (d) Is he going or isn't he going?
- (e) He is going or he isn't going.
- (f) Which ones haven't you seen yet?
- (g) I will go if he doesn't go.

#### B. Ungrammatical, not generated.

- (175)(a) \*Is he going or isn't? (Excluded by constraints on ellipsis)
- (b) \*Have you seen him or haven't?
- (c) \*He wants n't to go. (Since NEG is within the embedded sentence, it is not followed by [+V] or NP.)
- (d) \*Is not he going? (Contraction is obligatory if NEG precedes NP.)

#### C. Grammatical, not generated by this rule.

- (176)(a) Is he going or not? (by ellipsis from Is he going or is he not going?)
- (b) Those rules will not work. (Option not taken)
- (c) He is going or he isn't. (From (174.f) by verbal ellipsis.)
- (d) Is he going or isn't he? (From (174.d) by ellipsis.)
- (e) I will go if he doesn't. (From (174.g) by ellipsis.)

### B. Sample Derivations

- (177) Hardly ever is he late.



- (180) Nobody has been hit by anyone. [Klíma (88.c)]
- (a) NEG has-en hit somebody someone.
  - (b) Anybody NEG has been hit by anyone.  
(Case-placement rules, SOME-ANY suppletion)
  - (c) NEG + anybody has been hit by anyone.  
(NEG-Attraction)
  - (d) Nobody has been hit by anyone. (ANY-NO  
Suppletion)

December 1968





## CONJUNCTION

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## II. INTRODUCTION

### A. Survey of Problems

We are concerned here with what has traditionally been called "coordinating" conjunction. Our primary concern is with structures containing and, but we also attempt to give an account of structures containing but or or. In particular, we shall investigate the structure of sentences like the following, especially (1.a-g) (which must, however, be regarded as a representative sample rather than an exhaustive summary of types):

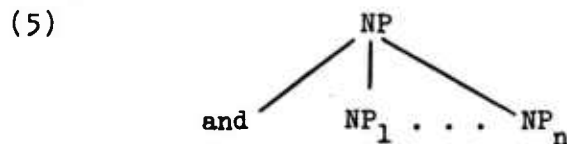
- (1) (a) John is in the house and Mary is at school.  
 (b) John and Bill left.  
 (c) I gave the boy both a nickel and a dime.  
 (d) I gave the boy a nickel and the girl a dime.  
 (e) Emily may be, and everyone agrees that Millicent definitely looks, pregnant.  
 (f) John and Mary sang and danced respectively.  
 (g) Julian ate pears, Jill peaches, and Jake papayas.
- (2) (a) (Either) John is playing basketball or his brother is jumping on the roof.  
 (b) (Either) Jonathan or David played the harp.  
 (c) I'll give (either) a nickel to the boy or a dime to the girl.
- (3) (a) Algernon went home but Nathaniel stayed.  
 (b) I gave the boy a nickel but the girl a dime.

In recent treatments of conjunction by generative grammarians, attention has been focused on two major questions: (1) Is there a deep-structure relationship between conjoined sentences (such as (1a) and other conjoined structures? (2) If there is such a relationship, how many distinct devices (sets of rules or rule schemata) are required to derive these other conjoined structures from conjoined sentences?

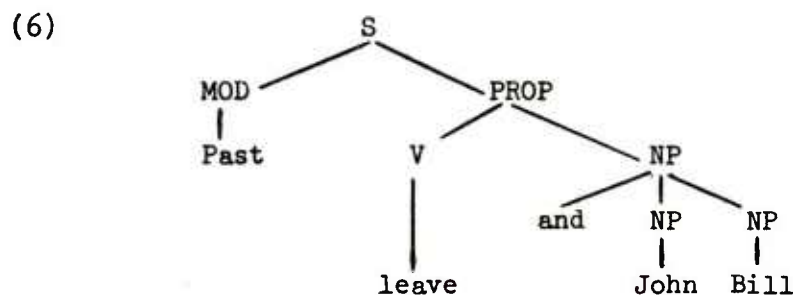
Relevant to the first question is the choice between two possible sources for sentences such as (1.b). First, we might wish to generate the conjoined structure (John and Bill) in this sentence by means of a phrase structure rule like:

- (4)  $NP \rightarrow \text{and } NP \text{ } NP^*$

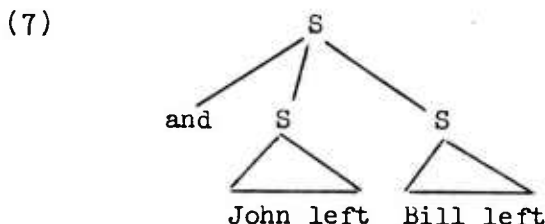
where (4) represents an infinite schema generating, in the first instance, structures like:



This approach, known as "phrasal conjunction", would provide for (1.b) a deep structure something like:



Alternatively, we might wish to say that the deep structure underlying (1.b) comes from the rule generating coordinate sentences in the base (PS Rule 1), and is, roughly:



Where a deep structure such as (7) is modified to produce a surface form such as (1.b), we shall call this process "derived conjunction". (The process has also been called "conjunction reduction".)

The first question, then, may be restated as follows: Is there derived conjunction, and, if so, which constructions result from it and which from phrasal conjunction? (It is, of course, possible that certain surface constructions may result either from derived conjunctions or from phrasal conjunction: i.e., the constructions may be structurally ambiguous.) In the light of this restatement of the first question, the second may be restated: If there is derived conjunction, how many kinds of derived conjunction must be distinguished?

With regard to the second question we may note, first, the possibility of positing different derivational processes for sentences in which all of the conjuncts are full single constituents and those in which some of the conjuncts are not full single constituents. In (1.c), for example, the conjuncts a nickel and a dime are NPs, and thus full single constituents. In (1.d), on the other hand, the conjuncts the girl a nickel and the boy a dime are not full single constituents (each being a sequence of two NP's, and neither constituting an entire PROP). Similarly, in (1.e), the conjuncts Emily may be and everyone agrees that Millicent definitely looks are not full single constituents.

If we assume that (1.c-e) are all products of derived conjunction (and there is general agreement that at least (1.d) and (1.e) must be), we may wish to say either that there is a single derivational process involved in all three cases, or that there are two different processes involved, one for (1.c), the other for (1.d-e). Advocates of the latter position have sometimes used the terms "primary" and "secondary" conjunction for the processes involved in constituent conjunction and non-constituent conjunction respectively, and we shall follow this terminological practice. (Schane, however, uses the term "secondary conjunction" in a somewhat different sense--cf. Section C, below.)



In addition to the possibility of positing distinct derivational processes for primary and secondary conjunction, we may note two other kinds of distinctions that might be posited. We might wish to say that the derivation of sentences which contain respectively, such as (1.f), is different from that of sentences which do not contain respectively. (Respectively conjunction, unlike derived conjunction of other types, does not necessarily involve the "reduction" of identical constituents of underlying sentences.) And we might wish to say that the derivation of sentences such as (1.g), which involve "gapping" (i.e., the deletion of verbs--and, in some cases, additional material--from non-initial members of sets of conjoined sentences), is different from that of sentences that do not involve gapping.

To anticipate our answers to the questions with which we have been concerned, we shall argue, in the following sections, that: (1) Not only is there derived conjunction, but it is derived conjunction, rather than phrasal conjunction, that underlies essentially all conjunctions of non-sentences; and (2) With the exception of gapping, and certain other structures involving deletion, a single process is involved in all derived conjunction.

## B. Derived Vs. Phrasal Conjunction

We turn now to a detailed consideration of the question of derived and phrasal conjunction. There are three logically possible positions, all of which have had their supporters:

1. Both phrasal and derived conjunction are basic  
(Smith, Lakoff + Peters, Ross)
2. Only phrasal conjunction is basic  
(Wierzbicka, McCawley, Dougherty)
3. Only derived conjunction is basic  
(Gleitman, Bellert, Schane)

We shall consider these three positions in turn.

### 1. Both Phrasal and Derived Conjunction Basic

This position, which has been argued for most forcefully by Lakoff and Peters, asserts that certain surface conjunctions of non-sentences (especially of NP's) are derived by means of derived conjunction, others by means of phrasal conjunction, and still others, which represent cases of structural ambiguity, by either of these means. Consider the following examples:

- (8) (a) Diogenes and Sophocles are erudite.  
      (b) Diogenes is erudite and Sophocles is erudite.
- (9) (a) Oedipus and Jocasta are a happy couple.  
      (b) \*Oedipus is a happy couple and Jocasta is a happy couple.
- (10) (a) John and Mary are married.  
      (b) John is married and Mary is married.

It is clear that (8.b) is a paraphrase of (8.a), that (9.b) is not a paraphrase of (9.a) (and is, in fact, ungrammatical), and that (10.b) is a possible paraphrase of (10.a) (in the sense, "John and Mary are both married to someone"), but that (10.a) also has a sense ("John and Mary are married to one another") of which (10.b) is not a paraphrase. According to the position under scrutiny here, (8.a) is derived, by means of derived conjunction, from the structure underlying (8.b), (9.a) is derived by means of phrasal conjunction, and (10.a) is derived either by means of derived conjunction from the structure underlying (10.b) or by means of phrasal conjunction.

The capturing of paraphrase relations and the explication of ambiguities are, of course, standard aims of generatively-oriented analyses, and we consider the rather natural account of examples such as (8-10) provided by the Lakoff-Peters position to be the strongest argument in its favor. Lakoff and Peters themselves, however, have also argued for the need for phrasal conjunction on other grounds that we find less persuasive. (This particular argument, since it concerns only phrasal conjunction, might also be used in support of the position to be discussed in the next subsection.)

The argument has to do with sets of examples such as:

- (11) (a) Algernon is similar to Reginald.  
      (b) Reginald is similar to Algernon.  
      (c) Algernon and Reginald are similar.  
      (d) \*Algernon is similar and Reginald is similar.  
      (e) Algernon and Reginald are similar to one another.
- (12) (a) Priscilla debated with Marmaduke.  
      (b) Marmaduke debated with Priscilla.  
      (c) Priscilla and Marmaduke debated.  
      (d) \*Priscilla debated and Marmaduke debated.  
      (e) Priscilla and Marmaduke debated with one another.

As these examples show, there are certain adjectives, such as similar, and verbs, such as debate, which, when they are used transitively, express a relation (R) such that if  $xRy$  is true, then  $yRx$  is also true. Thus (11.a) entails (11.b) and (12.a) entails (12.b). Adjectives and verbs of this type may be called "symmetric predicates".

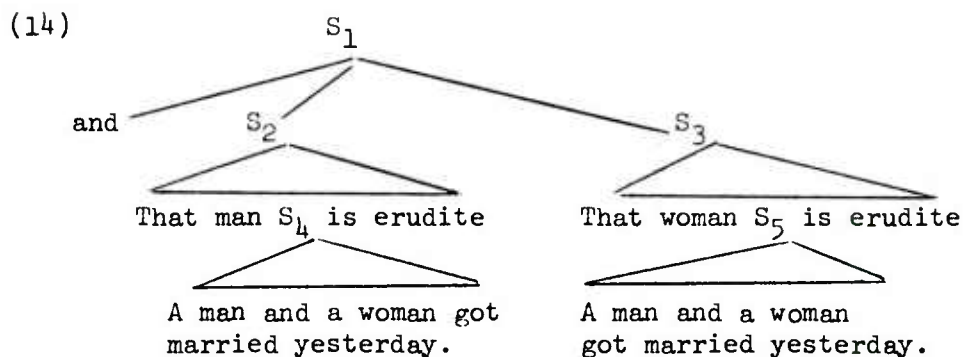
As Lakoff and Peters point out, symmetric predicates such as similar and debate may be used intransitively with conjoined subjects, as in (11.c) and (12.c). They point out, further, that the symmetry of the transitive uses of such predicates is paralleled by the reversability of the conjoined subjects in the intransitive uses of the predicates. (Thus Reginald and Algernon are similar is equivalent to (11.c), and Marmaduke and Priscilla debated is equivalent to (12.c).) They propose to capture this parallelism by deriving the transitive from the intransitive cases, by means of a "conjunct movement" transformation which moves one of the phrasally-conjoined subjects into object position.

While we agree with Lakoff and Peters that there is a relation among the members of sets such as (11.a-c) and (12.a-c), (and also agree with them that there is no relation between (11.c) and (11.d) or between (12.c) and (12.d)), we feel that a quite different account of the nature of the relations that obtain may be offered. We would propose (following Gleitman) that (11.c) is derived from (11.e), and (12.c) from (12.e) by means of an optional rule of reciprocal-pronoun deletion, and that (11.e) and (12.e) themselves are derived, by means of derived conjunction, from the deep-structure conjunction of the pairs of sentences (11.a-b) and (12.a-b) respectively. We shall attempt to defend this position in more detail in subsection B3, below.

However persuasive some of the arguments in support of the position that both phrasal and derived conjunction are required may be, the position seems to us to involve a number of very serious problems. One of these is the difficulty, given this position, of handling certain cases of relativization. Consider the sentences:

- (13) (a) That man and woman who got married yesterday  
are both erudite.  
(b) That man and woman who got married yesterday  
are a Republican and a Democrat respectively.

Given the Lakoff-Peters position, the deep-structure subject of the relative clauses in these sentences (in the sense "who got married to one another yesterday") must be phrasally conjoined: i.e., something like a man and a woman. But the matrix sentences into which the relative clauses are embedded do not involve phrasal conjunction. Presumably, the deep structure of (13.a) would have to be something like:



Now if we had generated just the subtree  $S_2$  (or the subtree  $S_3$ ), as an independent sentence, we would certainly want to block the relativization of  $S_4$  (or  $S_5$ ). That is, we would not want to generate:

- (15) \*That man who and a woman got married yesterday is erudite.

(Relativization is, in fact, blocked by what Ross (1967b) has called the "Conjunct Movement Constraint".) But in (14), once we have blocked relativization on the  $S_2$  cycle, can we ever get to the  $S_1$  cycle? (On the  $S_1$  cycle, derived conjunction would convert  $S_2$  and  $S_3$  into That man and that woman  $S_4$  are erudite, so that the conditions for relativization of  $S_4$  would be met.) Can we, in other words, ever derive (13.a)?

It is usually assumed that if an obligatory transformation (such as relativization) is blocked on some cycle, internal boundaries fail to get erased, and the entire derivation is blocked. We might, alternatively, suggest that a failure to erase internal boundaries does not itself block a derivation, and that if, on some later cycle, the conditions for boundary-erasure are met, the boundaries are erased on this later cycle and the resultant sentence is well-formed. Thus we might permit a later cycle to operate upon a structure like:

- (16) #that man # a man and a woman got married yesterday # is erudite#

and if, on this later cycle, we generate:

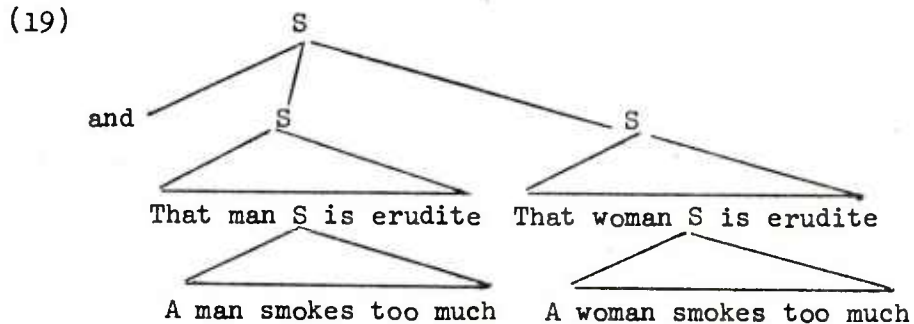
- (17) #that man and that woman # a man and a woman got married yesterday # are erudite#

we might permit relativization and boundary erasure to occur at this point.

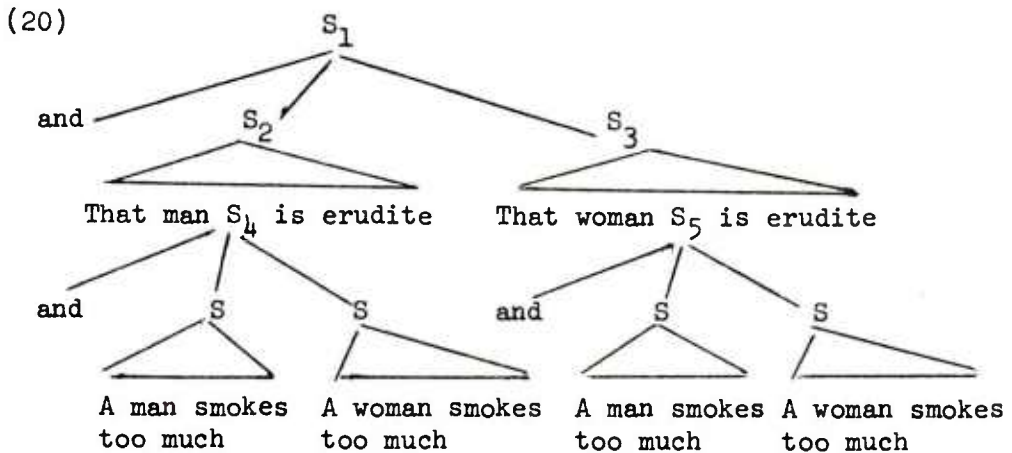
While such a change in the model, although curious, might be feasible, to allow it would seem to permit alternative deep structures for certain unambiguous sentences such as:

- (18) That man and woman who smoke too much are both erudite.

Presumably, if derived conjunction is permitted at all, the appropriate deep structure for (18) is something like:



However, the proposed change in the model would apparently permit a derivation of (18) not only from (19) but from (20) as well:



That is, after derived conjunction has applied on the  $S_4$  cycle,  $S_2$  would have a form similar to that of (16), i.e.:

- (21) #that man # a man and a woman smoke too much #  
is erudite#



If relativization is blocked at the  $S_2$  cycle (and the  $S_3$  cycle) but derived conjunction is nonetheless permitted to apply at the  $S_1$  cycle, we would eventually derive:

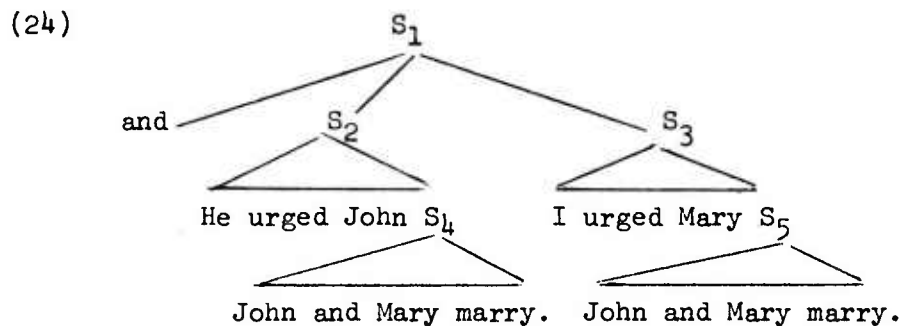
- (22) #that man and that woman # a man and a woman  
smoke too much # are erudite#

and (22) would then be transformable into (18).

Similar problems arise in handling certain cases of equi-NP deletion: e.g.,

- (23) He and I urged John and Mary respectively  
to marry (one another).

If the deep structure of (23) is something like:



then equi-NP deletion must be blocked at the  $S_2$  and  $S_3$  cycles, but permitted at the  $S_1$  cycle, after derived conjunction has occurred. Again, this requires a curious change in the model, and apparently permits alternative deep structures for such unambiguous sentences as:

- (25) He and I urged John and Mary respectively  
to go to New York and Chicago respectively.

A second, very different, objection to the position under discussion concerns the supposed ambiguities which the twofold mechanism predicts. It is not at all clear that there is an ambiguity in (1.b) (John and Bill left) comparable to that found in (10.a) (John and Mary married). It is true that there are two sentences:

- (26) (a) John and Bill left together.  
(b) John and Bill left separately.



which cannot both apply to any one situation, and that either (but not both) of these may be used at any time when (1.b) is applicable. Further we might identify the senses of (26.a) and (26.b) with those ascribed to phrasal and derived conjunction respectively. While there are no clear arguments for such an identification, however, there is at least one argument against it. In case John and Mary are brother and sister (for example), the most natural interpretation of (27) is that, at a double wedding, they married different spouses:

(27) John and Mary were married together.

It is not clear that (27) can be interpreted as a partial paraphrase of the symmetric sense of (10.a), although it can easily be interpreted as a partial paraphrase of the non-symmetric sense of this sentence. Hence there seems to be evidence that together, contrary to Lakoff and Peters' suggestion, is not a marker of phrasal conjunction.

Furthermore it is possible to find just as much, or as little, ambiguity as there is in (1.b) in the conjoined sentences of:

(28) John left and Bill left.

That is, (28), like (1.b), is noncommittal as to whether or not John and Bill left together. (Admittedly, the most usual interpretation of (1.b) would be that John and Bill left together, while that of (28) would be that they did not. However, we would maintain that both interpretations are possible for both sentences, and that the usual interpretations alluded to are a matter of the preferred interpretation of surface structures. We return to this point in subsections B.2 and B.3, below.) And, as Dougherty (1967b) has pointed out, the dichotomy suggested by alternative sources for sentences such as (1.b) will not account for cases where separate acts are performed together, as in:

(29) Jack, Bill, and Harry all died together.

Now, if both is a mark of derived conjunction, can it account for:

(30) John and Bill both got in on one ticket.

The last arguments against the position that both phrasal and derived conjunction are required are rather general. There are arguments, which Dougherty develops in detail (see subsection 2, below), for treating plural NP's and conjoined NP's as in some way closely related. For example, the subjects of:

- (31) (a) The men are here.  
 (b) Tom and Jack are here.

both select plural agreement in the verb. If there are two quite different sources for (31.b) the problem of relating both to plurals becomes just that much more difficult. Moreover, it seems that perhaps we cannot limit the relationship to plurals only to cases of phrasal conjunction, if there are acceptable sentences like (32):

- (32) Simon very quietly, and Peter with more haste  
 and noise, leave the dormitory each morning  
 at 5 a.m.

This sentence must have been derived from two deep structures and does not even exhibit superficial constituent conjunction. Yet there is plural agreement in the verb.

Finally, if it is possible to maintain with any consistency either of the other two positions, which claim that conjunction is really a single process, it seems that such a position should be preferred: either of them represents in effect a stronger claim than this one.

## 2. Only Phrasal Conjunction Basic

This position has been supported in detail only rather recently, and from several different points of view. Wierzbicka's arguments for the position are primarily logico-semantic. She points out, first, that conjoined noun phrases in subject position, like plurals, always constitute a single semantic unit (the "argument" on which a "predication" is made). Thus (1.b) (John and Bill left) does not contain two separate predications, one on John, the other on Bill, but, rather, a single predication. She claims, in addition, that (28) (John left and Bill left), the putative sentential source for (1.b), is a curious sentence, and in any case is not a perfect paraphrase of (1.b).

Wierzbicka suggests, further, that there are grounds for regarding the underlying argument in sentences such as (1.b) not as the conjuncts themselves but, rather, as a separately defined set equivalent to some plural NP. If we consider the sentences:

- (33) (a) The men and the women are all here.  
 (b) The men and the tables are all here.

we note that while (33.a) is perfectly normal, (33.b) is rather peculiar. Wierzbicka would relate the normality of (33.a) (and of (1.b)) and the peculiarity of (33.b) to the fact that, while it is easy to find an NP--e.g., the people--which expresses a semantic common denominator between the men and the women (or between John and Bill), it is more difficult to find such an NP in the case of the men and the tables. If a common denominator is in fact required for surface conjunction of NP's in subject position, it seems reasonable, Wierzbicka suggests, to regard this common denominator itself, rather than the conjoined NP's, as the underlying subject or argument, and to say that, in the deep structure, the (phrasally) conjoined NP's occur in apposition to this underlying subject.

While we do not accept this last suggestion of Wierzbicka's regarding the deep structure of sentences such as (1.b) and (33.a), we do accept her general observation regarding the lack of a perfect paraphrase relationship between sentences with conjoined NP's and the conjoined sentences which, in our view, underlie them. We also accept her observation that constituent conjunction implies a semantic common denominator between the constituents. In fact, we would go further than Wierzbicka does, and assert that the implication of a semantic common denominator is by no means restricted to conjoined NP's. If we compare the following sentences with (33.a-b):

- (34) (a) I can sing and dance.  
(b) I can sing and analyze conjunction.

we find that (34.a), like (33.a), is quite normal, while (34.b), like (33.b), is peculiar, and in much the same way. Our account of the phenomena that Wierzbicka has brought to light is, however, different from hers. (For a presentation of this account, cf. subsection B.3, below.)

McCawley and Dougherty have both presented a number of syntactic arguments in favor of the position that only phrasal conjunction is required. Since Dougherty's exposition is the fuller one, incorporating all of McCawley's arguments and adding others, we shall direct our attention primarily to this exposition.

Dougherty points out, then, that conjoined NP's and plurals exhibit many similarities. Among these similarities are: distribution in relation to the quantifiers all, both, each and respective(ly) (examples (35-38) below); similar behavior with

respect to the following transformations: pronominalization (39), number agreement (40), reflexive pronominalization (41), and reciprocal pronominalization (42). Consider the pairs of sentences:

- (35) (a) Peter, John, and Harry all went home.  
(b) The boys all went home.
- (36) (a) Sacheverell and Osbert both write books.  
(b) The brothers both write books.
- (37) (a) The Republican and the Democrat each claimed a moral victory.  
(b) The two politicians each claimed a moral victory.
- (38) (a) Sam and Saul kissed Sally and Susie respectively.  
(b) The men kissed their respective wives.
- (39) (a) Tom and Bill went to New York, where they saw a movie.  
(b) The men went to New York, where they saw a movie.
- (40) (a) Miss Jones and Miss Smith are schoolteachers.  
(b) The women are schoolteachers.
- (41) (a) Dickie and Billie hurt themselves.  
(b) The children hurt themselves.
- (42) (a) Dickie and Billie hurt each other.  
(b) The children hurt each other.

If one assumes, with Dougherty, that plurals are not derived from, or closely related to, conjoined sentences, examples like the above constitute a *prima facie* argument against deriving conjoined NP's from conjoined sentences. The argument may be restated as follows: (a) plural NP's and conjoined NP's show highly similar syntactic behavior; (b) therefore, plural NP's and conjoined NP's must correspond to highly similar deep structures; (c) plural NP's are not derived from conjoined sentences; (d) therefore conjoined NP's are not derived from conjoined sentences. (We may note, in passing, that we entirely accept steps (a) and (b) of this argument, but question step (c), and therefore question the conclusion, (d).)

Another argument that Dougherty presents against permitting the derivation of conjoined NP's from conjoined sentences has to do with examples like the following:

- (43) (a) John paid for Mary and Bill paid for himself (  $\Leftarrow$  Bill).  
 (b) \*John and Bill paid for Mary and himself respectively.  
 (c) \*John and Bill paid for Mary and Bill respectively.

If sentence conjunction underlies respectively conjunction, how can we block the derivation of the ungrammatical (43.b) (or 43.c) from the grammatical (43.a)? (Dougherty and McCawley present several other minor arguments against permitting any derived conjunction of NP's. Since these arguments are more or less subsumed under the general argument concerning the relation between conjoined and plural NP's, we shall not go into them in detail.)

Having reached the conclusion that conjoined NP's are not derived from conjoined sentences, Dougherty goes on to propose that no conjunctions of full single constituents be derived from conjoined sentences. Instead, he suggests that all such conjunctions are phrasal in nature, and that the base includes schemata for generating conjunctions of all types of constituents that occur conjoined in surface forms. He proposes, further, that all quantifiers occur (in feature form) in the base, where they are associated with the constituents to which they pertain, whether these constituents are NP's, as in (35-38) or constituents of other types as in:

- (44) (a) John both sings and dances.  
 (b) The husband and wife are tall and short respectively.

Dougherty does recognize the need for derived conjunction in the cases that have been called "secondary conjunction" (e.g., (1.d-e) and "gapping" (e.g., (1.g)): i.e., those cases in which the surface conjuncts are not full single constituents. Apart from such cases, however, he maintains that all conjunction is phrasal in nature.

To balance the arguments in favor of Dougherty's proposal, there are several arguments against it. Of these, the most powerful is the following: it is impossible that all conjunctions of full single surface constituents are phrasal if constituents appearing in different places in the deep structure can be conjoined, and there appear to be many such cases: e.g.,



- (45) (a) John went to the party and appeared to have a good time.  
 (b) The message was ambiguous and was misunderstood by almost everyone.  
 (c) He is popular and likely to succeed.  
 (d) The article is coherent and easy to read.  
 (e) He receives and distributes vast sums of money.

In the surface structure of (45.a), went to the party and appeared to have a good time is a set of conjoined PROP's (or VP's), but in the deep structure, appeared to have a good time is not even a constituent. (That is, we are assuming that John appeared to have a good time is derived transformationally from a deep structure more closely corresponding to It appeared that John had a good time ( ← \*That John had a good time appeared).) Similarly the conjoined surface structure PROP's (or VP's) of (45.b), was ambiguous and was misunderstood by almost everyone, cannot be conjoined in the deep structure if the latter arises only by means of a passive transformation.

In examples (45.c) and (45.d) we find conjoined surface structure adjectivals: popular and likely to succeed and coherent and easy to read respectively. But these adjectivals cannot be conjoined in the deep structure if one assumes the usual transformational derivation of phrases like likely to succeed and easy to read. (That is, we are assuming that He is likely to succeed is derived from a deep structure more closely corresponding to That he will succeed is likely, and that The article is easy to read is derived from a deep structure more closely corresponding to To read the article is easy.)

Examples like (45.c) pose a similar problem for Dougherty's analysis if one assumes a case-grammar base. In such a base, receive would be marked as co-occurring with Neutral NP (vast sums of money in the example) and a Dative NP (presumably, he in the example) while distribute would be marked as co-occurring with a Neutral NP (again, vast sums of money) and an Agent NP (again, presumably he). But if receive and distribute is derived from a phrasally-conjoined V, it is impossible to assign a case to he, since a single NP cannot simultaneously be Dative and Agentive.

It is, of course, admitted by Dougherty that some kind of reduction of conjoined sentences will be necessary for instances of non-constituent conjunction. But to generate a sentence such as (45.c) from conjoined sentences, it would be necessary to extend the reduction mechanism to cover some cases of conjunction of (surface) constituents. Such a rule would have to operate after the second conjunct of (45.c) had become:



- (46) He is likely to succeed.

But in that case (47.a) must provide one source for (47.b):

- (47) (a) He is popular and he is successful.  
(b) He is popular and successful.

Thus the distinction between constituent and non-constituent conjunction breaks down, and unwanted ambiguities are postulated.

Before concluding this counter-argument to Dougherty's proposal, we may note that some of the same quantifiers that occur with conjoined surface constituents in general occur with those conjoined surface constituents that apparently must occur in different places in deep structure. Thus there are sentences such as:

- (48) (a) He is both popular and likely to succeed.  
(b) John and his wife are easy to please and eager to please respectively.  
(c) John and Bill went to the party willingly and appeared reluctant to go respectively.

Such sentences provide counter-examples to Dougherty's suggestion that all quantifiers are associated in the deep-structure with those constituents with which they are associated in the surface structure. If popular and likely to succeed, as was argued above, cannot be a deep-structure constituent, then Dougherty's account of the quantifiers cannot be correct for sentences like (48.a).

Further difficulties for Dougherty's proposal about quantifiers are provided by sentences such as:

- (49) (a) John bought, and Mary sold, a house and a car respectively.  
(b) I gave both a nickel to the boy and a dime to the girl.

Since these sentences involve the conjunction of non-constituents, they must (and Dougherty would, presumably, agree) be derived from conjoined sentences. Yet the quantifiers that occur in them (respectively in (49.a), both in (49.b)) cannot have been constituents of these conjoined sentences, as is evidenced by the ungrammaticalness of:

- (50) (a) \*John bought a house (respectively) and Mary sold a car respectively.  
(b) \*Both I gave a nickel to the boy and I gave a dime to the girl.

Hence it must be the case that quantifiers may be introduced in the course of derived conjunction. But if this is so, then Dougherty's proposal about the introduction of quantifiers falls short of its stated, and worthy, goal of providing a uniform account of the quantifiers.

The above arguments--and in particular the first--force us to conclude that, however attractive the position that all constituent conjunction is phrasal may be, this position is untenable. As we have seen, there are cases of surface constituent conjunction that apparently cannot be traced to deep-structure phrasal conjunction. If this is so, then the arguments in favor of phrasal conjunction that have been offered by Wierzbicka, McCawley, and Dougherty can only be viewed as further arguments in support of the position that both phrasal and derived constituent conjunction are basic. But this latter position, as we saw in subsection B.1, above, is fraught with various difficulties. Since these difficulties can be avoided only if a uniform derivation can be provided for all constituent conjunction, and since the proposal that only phrasal conjunction is basic has been found to be inadequate, we must conclude that, unless insuperable objections can be found to the third logically possible position--namely, that only derived conjunction is basic--it is this position that must be adopted.

### 3. Only Derived Conjunction Basic

Gleitman was the first to develop this position in detail, providing the main arguments and pointing to a small residue of cases difficult or impossible to handle. In adopting this position, we find that, although we are able to account for somewhat more of the data than was Gleitman, some of the difficult cases still resist analysis. However, we do not regard any as posing a threat to this position as serious as those posed for the alternative positions by the arguments we have presented above. We feel, and hope to demonstrate in Section III, that adopting the position that essentially all non-sentence conjunction is derived from sentence conjunction permits us to give a coherent account of the phenomena in question, emphasizing their underlying unity. Further, we believe that we can handle most of the problems that have been raised by proponents of one of the other two positions.

First, there are the arguments of those who favor two methods of derivation. These, as we have seen, center largely around the derivation of symmetric predicates. To begin with, we may note our agreement with Langendoen that some of the predicates that show the

syntactic behavior attributed to symmetric predicates are not, in fact, logically symmetric. That is, in our opinion, (51.a)  $\neq$  (51.b) (and neither (51.a) nor (51.b) = (51.c)).

- (51) (a) Johnson agreed with Kosygin.
- (b) Kosygin agreed with Johnson.
- (c) Johnson and Kosygin agreed.

If this is so, then the claim that sentences like (51.a-b) are derived from sentences like (51.c) loses much of its force. That is, if meaning is not always preserved under the proposed "conjunct-movement" transformation (a transformation which is, in any case, suspect in that it represents a unique case of movement of material out of a conjoined structure), it can hardly be claimed that the preservation of meaning in some cases (e.g., (11.a-c)) proves the validity of the proposed derivation. (Since we, in general, take the view that transformations may affect meaning in certain limited ways--i.e., that there are certain rules of surface-structure interpretation--we could not argue that the semantic non-equivalence of (51.a-c) itself proves that these sentences do not have a common deep structure.)

In our view, the fact that certain predicates which are not logically symmetric show syntactic properties similar to those of predicates which are logically symmetric indicates that it cannot be the inherent symmetry of the latter that underlies their syntactic behavior. While we do feel that symmetric predicates like similar and quasi-symmetric predicates like agree belong to a single syntactic class, we would claim that this class is defined not by "symmetry" but, rather, by susceptibility to a reciprocal-pronoun-deletion transformation. Thus we would propose derivations like the following:

- (52) Johnson agreed with Kosygin and Kosygin agreed with Johnson.

⇒ (by derived conjunction, etc.)

Johnson and Kosygin agreed with Kosygin and Johnson respectively.

⇒ (by reciprocal pronominalization)

Johnson and Kosygin agreed with one another.

⇒ (by reciprocal-pronoun deletion)

Johnson and Kosygin agreed.

We feel that the derivation (52), which is essentially Gleitman's, accounts for the "symmetrical" character of (51.c) (which is, we would maintain, not present in (51.a) or (51.b)) in a quite natural way. A similar derivation may be proposed for other sentences involving symmetric and quasi-symmetric predicates: e.g.,

- (53) (a) John and Mary got married (to one another).
- (b) Priscilla and Marmaduke debated (with one another).
- (c) Wilshire Blvd. and Sunset Blvd. are parallel (to one another).
- (d) Phrasal and derived conjunction are not distinct (from one another).

Reciprocal-pronoun deletion also seems to provide a viable account of certain occurrences of together in sentences involving conjoined noun phrases: e.g.,

- (54) (a) John and Bill left together (with one another).
- (b) Katz and Postal wrote the book together (with one another).
- (c) John and Bill together (with one another) own 15 horses.

It may also be involved in examples like the following:

- (55) (a) Goneril and Regan departed at the same time (as one another).
- (b) Hans and Fritz got in (with one another) on one ticket.

There is a residue of recalcitrant cases. For example:

- (56) (a) Beelzebub and Jezebel are a delightful couple.
- (b) Heifetz, Rubenstein, and Casals are an outstanding trio.
- (c) Tom, Dick, and Harry are three of my best friends.

While we can account for the great majority of conjoined NP's that receive a "joint" (or "phrasal") interpretation on the basis of underlying conjoined sentences of the type that, after derived conjunction, etc., are subject to reciprocal pronominalization and reciprocal-pronoun deletion, there appear to be no such underlying sentences in the case of (56):

- (57) (a) \*Beelzebub is a delightful couple (together) with Jezebel and Jezebel is a delightful couple (together) with Beelzebub.

- (b) \*Heifetz is an outstanding trio (together)  
with Rubenstein and Casals, and Rubenstein  
is...
- (c) \*Tom is three of my best friends (together)  
with Dick and Harry, and Harry is...

Although it might be possible to argue that the ungrammatical (57.a-c) do in fact underlie the grammatical (56.a-c) respectively-- i.e., that items like couple, trio, and the cardinal numbers are marked as insertable, in certain cases, only into conjoined sentences which then obligatorily undergo derived conjunction, etc., we do not feel that such a solution, which is, essentially, the one proposed by Bellert, is very attractive. Semantically, a more plausible source for (56.c) might be:

- (58) Tom is one of my best friends and Dick is one  
of my best friends and Harry is one of my best  
friends.

To derive (56.c) from (58) would require that the linguistic model include a component that can perform certain arithmetic operations. (As Gleitman has observed, such a component would seem to have little to do with the grammar proper.) Given this component, it might be possible to say that such NP's as a couple and a trio may represent obligatory reductions from two (members) of a couple and three (members) of a trio respectively. That is, the derivation of (56.a) might be something like:

- (59) Beelzebub is one (member) of a delightful couple  
and Jezebel is one (member) of a delightful  
couple.

⇒ \*Beelzebub and Jezebel are two (members) of a  
delightful couple.

⇒ Beelzebub and Jezebel are a delightful couple.

In any case, once the general problem of the behavior of numbers is solved, it seems that it should not be difficult to account for such items as couple and trio. (It may be pointed out that numbers and items like couple and trio constitute something of a problem-- though a lesser one--for the "only-phrasal-conjunction-required" approach as well, at least if we wish to differentiate (56.a-c) from:

- (60) (a) ?Beelzebub, Jezebel, and Baal are a  
delightful couple.
- (b) ?Heifetz and Rubenstein are an outstanding  
trio.
- (c) ?Tom, Dick, Harry, and Oscar are three of  
my best friends.)



To turn now to the arguments that have been raised by advocates of the position that only phrasal conjunction is required, we agree with Wierzbicka's observation that there is not a perfect paraphrase relation between sentences with conjoined NP's and sentences in which these NP's occur in separate conjoined sub-sentences. As was noted earlier, we would, in fact, extend Wierzbicka's observation to cover the lack of a perfect paraphrase between sentences with conjoined constituents of any type and their presumed (in our opinion, correctly presumed) conjoined-sentence sources. We would attribute such phenomena, however, to rules of surface-structure interpretation which are related to performance factors having to do with the circumstances under which a speaker chooses to make use of derived conjunction--or, for that matter, of sentence conjunction. That is, we would say that speakers choose to conjoin constituents, whether sentences or constituents of other types, only when they wish to express some relation between these constituents. (The relation may be one of similarity, contrast, simultaneity, succession, etc.) Thus, just as (33.b) (The men and the tables are here) and (34.b) (I can sing and analyze conjunction) are rather anomalous, so also is:

- (61) John is eager to please and flying planes can be dangerous.

We would attribute such anomalies to the existence of a rule of surface-structure interpretation which tells us, roughly, "If constituents are conjoined, they necessarily have a semantic relation," and to our inability to discover the nature of the relation in such cases.

As for the difference in interpretation, and in acceptability, between (1.b) (John and Bill left) and (28) (John left and Bill left), we would attribute this to the interaction between the above rule of surface-structure interpretation and its converse: "If constituents (that are conjoinable) are not conjoined, they do not necessarily have a semantic relation." Sentence (1.b) tells us, in effect, that there is a semantic relation between John and Bill; sentence (28), on the other hand, tells us that, while there is a semantic relation between John left and Bill left, there may not be a semantic relation between John and Bill. But, since we know that there can be a semantic relation between John and Bill, and since it is rather hard to imagine what the relation between John left and Bill left may be if we are not choosing to assert the semantic relation between John and Bill, we find sentence (28) somewhat puzzling.



Turning to the arguments of Dougherty and McCawley, we would say, first, that we accept absolutely their demonstration of the similarities between conjoined NP's and plurals, and the inference that they draw from this similarity to the effect that conjoined NP's and plurals must correspond to highly similar deep structures. However, we see no problem in principle in deriving virtually all plurals from conjunction (as was suggested by Postal at the 1967 San Diego Conference on English Syntax). It would seem that, if there is to be any derived conjunction at all, the "collapsing" of a set of formally identical but referentially distinct singular NP's into a single plural NP must somehow be provided for. Consider the sentences:

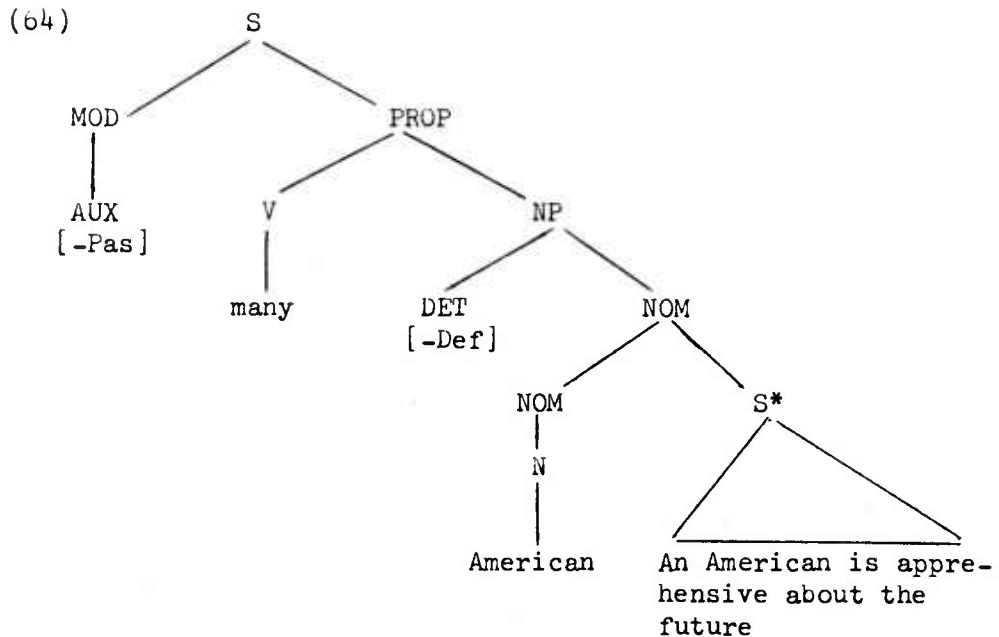
- (62) (a) My wife visited her mother yesterday and I visited my mother yesterday.  
 (b) My wife and I visited our (respective) mothers yesterday.  
 (c) My wife visited her mother yesterday and I called my mother yesterday.  
 (d) My wife visited, and I called, our (respective) mothers yesterday.

The derivation of (62.d) (if it is fully grammatical) from the structure underlying (62.c) is particularly interesting, since (62.d) represents a case of secondary (i.e., at least partially non-constituent) conjunction, and hence could not be derived by means of phrasal conjunction.

While the derivation of all plurals (except items such as scissors, trousers, etc.) by means of derived conjunction seems attractive in principle, there are certain practical problems with such a derivation that have led us not to attempt to incorporate this derivation of plurals into the present grammar. Consider the sentences:

- (63) (a) Many Americans are apprehensive about the future.  
 (b) Approximately one hundred oysters will be eaten.  
 (c) Infinitely many points can be considered to lie between any two points on a line.  
 (d) Over ten thousand demonstrators assembled.

One possible account of such sentences might be to say that the quantifiers and numerical expressions included in them (many, approximately one hundred, etc.) are themselves predicates in the deep structure and are incorporated into the NP's of which they are surface-structure constituents as the result of transformations. Thus the deep structure underlying (63.a) might be something like:



(where S\* = any number of identical conjoined Ss)

This would be transformed into:

(65) ?Americans who are apprehensive about the future  
are many.

which would, in turn, be transformed into (63.a).

An underlying structure like (64), while rather "deep", is by no means unusually so by contemporary standards. Implementing the proposed derivation of (63.a) would, however, no doubt involve many problems that have not thus far been investigated, and for this reason we have, in the grammar as a whole, taken a conservative view of the deep structure of quantifiers, and consequently of plurals. We do believe, however, that something like the derivation of quantifiers and plurals just sketched may be valid, and that such a derivation could provide the kind of uniform account of conjoined and plural NP's which Dougherty and McCawley properly require, without introducing the difficulties involved in their particular approach.

Other problems raised by Dougherty and/or McCawley seem to us less serious. For example, while it is probably true that

(43.b) (\*John and Bill paid for Mary and himself respectively) is ungrammatical, there is no general constraint on the conjunction of reflexive pronouns and NP's of other types. Thus the following are fully grammatical:

- (66) (a) John paid for both himself and Mary.  
 (b) John will pay for either himself or Mary.

It would seem that, just as the phrasal-conjunction approach must somehow block the generation of respectively with two conjoined NP's only one of which is a candidate for reflexivization, so must the derived-conjunction approach block the reduction of two conjoined sentences with corresponding reflexive and non-reflexive NP's when such reduction would require the insertion of respectively with these NP's.

In summary, then, while we admit that there are still certain unsolved problems that must be faced by anyone advocating the position that only derived conjunction is required, we feel that the problems themselves are less serious than those that must be faced by advocates of the other positions we have discussed, and that the prospects for solving the problems that do exist are brighter than they are in the other cases. For this reason, we have decided to exclude phrasal conjunction from the grammar.

### C. Types of Derived Conjunction

Two lines of argument have been followed by those who favor making a basic distinction between primary and secondary derived conjunction. (For definitions, cf. Section A, above.) The first line of argument has to do with the relative acceptability, or normality, of the structures. The second has to do with the relative systematicness of the derivational processes involved. Both lines of argument were suggested originally by Chomsky. The first has been pursued to some extent by Gleitman; the second has been considerably elaborated by Schane.

In initiating the first line of argument, Chomsky notes that sentences in which the conjuncts are not constituents--e.g., (1.d-e) or:

- (67) Nick watered, and Sue weeded, the garden

--are, in general, marked by special phonological features, such as an extra-long pause (in (67), between weeded and the), contrastive stress and intonation, and failure to reduce vowels and drop

consonants even in rapid speech. He suggests that such features may indicate that sentences of this type, as opposed to sentences in which the conjuncts are constituents, are "semi-grammatical", or require the development of a theory of "degrees of grammaticality".

Gleitman (1965) accepts this suggestion, observing that some sentences which involve the conjunction of non-constituents (e.g., (68)) are uniformly accepted by native speakers, others (e.g., (69)) are judged to be awkward but acceptable, while still others (e.g., (70)) are rejected.

- (68) (a) I gave the boy a nickel and the girl a dime.
- (b) The Soviets rely on military and on political indications of our intentions.
- (c) He took John home and Mary to the station.
- (d) The conjunction of an imperative and an interrogative sentence is excluded.

(69) The man saw and the woman heard the shot fired.

(70) ?I want to know why John and when Mary are (is?) coming.

Because of the apparent unpredictability (at least in the absence of more data) of informant responses to sentences which involve non-constituent conjunction, Gleitman chooses not to attempt to provide any general account of their derivation, and concentrates instead on the conjunction of constituents, with regard to which, in general, such problems do not arise.

The second line of argument for distinguishing primary from secondary conjunction stems from Chomsky's observation that, while conjunctions of constituents ("of the same type") occurring in otherwise identical sentences are generally grammatical, at least some conjunctions of non-constituents occurring in such sentences are clearly ungrammatical. Thus (71.b), which involves the conjunction of two prepositional phrases occurring in identical contexts in (71.a), is grammatical, while (72.b), which involves the conjunction of two non-constituent strings occurring in identical contexts in (72.a), is not.

- (71) (a) The scene of the movie was in Chicago and the scene of the play was in Chicago.
- (b) The scene of the movie and of the play was in Chicago.

- (72) (a) The liner sailed down the river and the tugboat chugged up the river.  
 (b) \*The liner sailed down the and tugboat chugged up the river.

Such evidence points to a conclusion that, while constituent conjunction is systematic, non-constituent conjunction is idiosyncratic, in some cases (e.g., (67), (68)) resulting in grammatical--or at least "semi-grammatical"--sentences, in others (e.g., (72)) resulting in ungrammatical strings.

Schane, however, observes that some types of constituent conjunction also appear to be idiosyncratic. Thus, although men and woman in (73.a) are constituents of the same type occurring in otherwise apparently identical conjoined sentences, their conjunction is, in fact, impermissible, as is evidenced by the ungrammaticalness of (73.b).

- (73) (a) The men are here and the woman is here.  
 (b) \*The men and woman are here.

On the other hand, the following is clearly well-formed:

- (74) The men and women are here.

Similarly, while (75.b) can be derived from (75.a), (76.b) cannot be derived from (76.a):

- (75) (a) I bought these pictures and (then) I bought those pictures.  
 (b) I bought these and (then) those pictures.  
 (76) (a) I bought a picture and (then) I bought another picture.  
 (b) \*I bought a and (then) another picture.

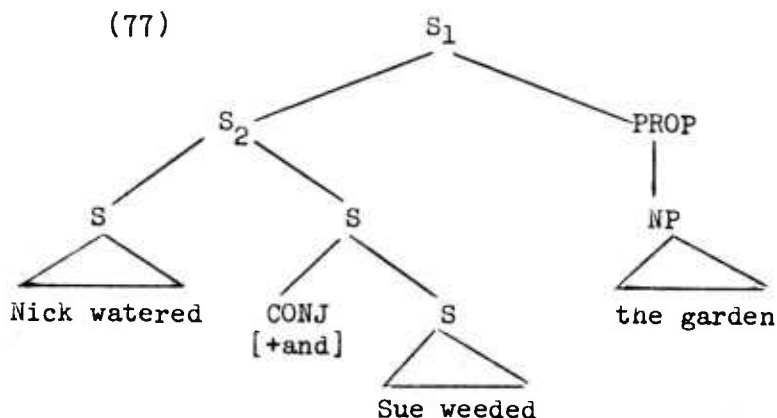
On the basis of such observations, Schane concludes that it is not only the conjunction of non-constituents that is idiosyncratic but also that of constituents of certain specifiable types. Specifically, he concludes that only the conjunction of constituents that correspond to major categories that are not also lexical categories is fully systematic, and that all other conjunction is idiosyncratic. ("A category that appears on the left in a lexical rule we shall call a lexical category; a lexical category or a category that dominates a string ...X... where X is a lexical category, we shall call a major category." Chomsky, (1965), p. 74.)



This conclusion prompts Schane to propose a distinction between primary and secondary conjunction that is rather different from the one presented in Section A. For Schane, primary conjunction is the conjunction of just those constituents that correspond to major categories that are not also lexical categories (e.g., NP), while secondary conjunction is the conjunction either of non-constituents or of constituents that correspond to lexical categories (e.g., N as in (74)) or to non-major categories (e.g., DET, as in (75.b)).

To provide for primary conjunction Schane proposes a schema which operates to replace two (or more) conjoined sentences with a single sentence that includes two (or more) conjoined constituents of the appropriate type. To provide for secondary conjunction, he proposes a set of deletion rules which operate either upon conjoined sentences or upon certain specified products of the primary-conjunction schema.

With regard to the first line of argument that has been used to support a basic distinction between primary (constituent) and secondary (non-constituent) conjunction--i.e., the argument to the effect that the latter are "semi-grammatical"--we would say, first, that in those cases where sentences involving non-constituent conjunction show the special phonological characteristics noted by Chomsky, these characteristics are entirely predictable on the basis of the derived structure. For example, we believe that the derived structure of (67) is something like:



It is, we would claim, the occurrence of the constituent break between  $S_2$  and PROP that accounts for the special phonological characteristics of (67): i.e., we would say that whenever there is a constituent break between an S and some constituent other than S, such characteristics may be predicted. (It may be noted, in



this connection, that those cases of non-constituent conjunction, such as (68.a), which do not, in our analysis, have a derived structure in which there is a constituent break between an S and some constituent other than S, do not show the phonological characteristics in question.)

As for the differences in acceptability between, say, (68.a) and (70), these, in our opinion, have to do with such performance factors as conformity with, or violation of, rules of surface-structure interpretation such as those suggested in Section B.3, above. Thus, in the case of (70), it is hard to find any semantic relation between the conjuncts why John and when Mary.

With regard to the second line of argument, we would argue, first, that the grammar has much to gain in generality if we allow a single conjunction schema to operate not only on major non-lexical constituents but also, in appropriate cases, on non-major constituents, lexical constituents, and non-constituents. Further, we feel that many of the cases of impermissible conjunctions cited by Schane can be explained on a principled basis without recourse to the kind of fundamental distinction he proposes. For example, in our opinion the ungrammaticalness of (73.b) stems not from any idiosyncrasy in the conjunction-potential of nouns, but, rather, from the fact that the two occurrences of the in (73.a) are only superficially identical, and hence cannot be treated by the conjunction schema as repetitions of the same item. Specifically, we would say that the the that precedes men has the feature [+Plural/Mass] while the the that precedes women has the feature [-Plural/Mass]. Thus, just as the [+Plural/Mass] and [-Plural/Mass] indefinite articles some and a must be treated as distinct items in derived conjunction, so must the [+Plural/Mass] and [-Plural/Mass] definite articles, although the latter happen to have identical forms. The parallelism between the indefinite and the definite articles is attested to by examples such as the following:

- (78) (a) We bought some beans and spinach.  
 (b) We bought the beans and spinach.  
 (c) \*We bought some beans and carrot.  
 (d) \*We bought the beans and carrot.  
 (e) \*We bought some spinach and carrot.  
 (f) \*We bought the spinach and carrot.

Similarly, we feel that the ungrammaticalness of (76.b) stems from a general condition on the non-conjoinability of unstressed articles (similar to the condition on the non-conjoinability of inflectional affixes). Note that, if the unstressed article a in

(76.a) is replaced by its stressed counterpart one, the sentence becomes much more acceptable:

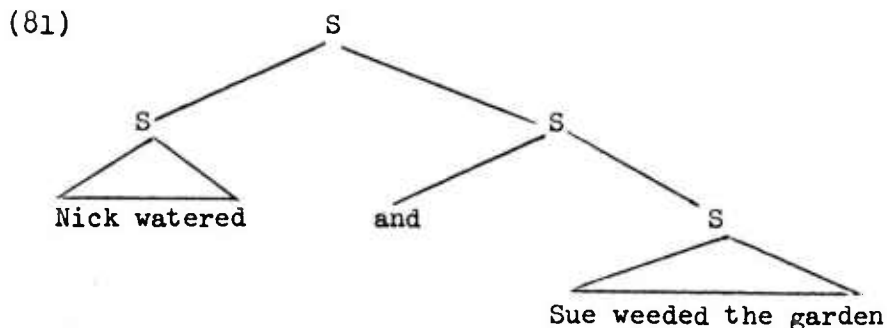
(79) I bought (first) one and then another picture.

While, then, it is likely that there are still some genuine idiosyncracies to be accounted for, we feel that such idiosyncracies as do remain hardly constitute a basis for making the kind of basic distinction between two different derivational processes that Schane has proposed.

As for Schane's specific proposal that all cases of secondary conjunction be derived by means of deletion rules, two strong counter-arguments can be offered. In the first place, to treat all conjunctions of non-constituents as arising from the simple deletion of elements of underlying conjoined constituents results, in many cases, in an incorrect derived structure which cannot account for the intonational characteristics of the sentences in question. Thus if (67) (Nick watered, and Sue weeded, the garden.) is generated simply by deleting the first occurrence of the garden from:

(80) Nick watered the garden and Sue weeded the garden.

it has the derived structure:



But, as we have seen, it is a derived structure like (77) that is needed to account for the intonational facts.

The second counter-argument against dealing with cases of non-constituent conjunction by means of deletion transformations is that such a derivation provides no account of the occurrence of certain quantifiers in these constructions. Thus if (49.b) (I gave both a nickel to the boy and a dime to the girl) is derived by deletion of the second occurrence of I gave from (82):

- (82) I gave a nickel to the boy and I gave a dime to the girl.

where does the both in (49.b) come from? These difficulties are compounded if one tries to account (as seems desirable) for non-constituent conjunction that involves respectively in a way consistent with non-constituent conjunction of other types. Thus sentences like (49.a) (John bought, and Mary sold, a house and a car respectively) clearly can not be derived by means of deletion transformations.

But in fact respectively conjunction has, in general, not been assumed to reflect the same derivational processes as derived conjunction of other types. More accurately, perhaps, respectively conjunction has been largely ignored by generative grammarians, who have preferred to concentrate instead on cases of derived conjunction which necessarily involve partial identity of the underlying sentences. We feel that the (sometimes implicit) assumption that respectively conjunction is unrelated to derived conjunction of other types is unwarranted, and that it is possible to develop a derived-conjunction schema which generates conjunctions that involve respectively and those that do not in a unified way, and which, incidentally, accounts in a straightforward manner for the paraphrase relations that sometimes obtain between cases of respectively and non-respectively conjunction: e.g.,

- (83) (a) John likes meat and loathes fish.  
(b) John likes and loathes meat and fish respectively.

The derived-conjunction schema that we shall propose underlies, we would claim, all sentences involving the conjunction of strings which are not themselves full sentences except for a certain limited set of cases where, in our opinion, the non-initial conjuncts do represent products of deletion transformations. One such case is constructions involving "gapping", such as (1.g) or:

- (84) John wants to see the house, and Bill, the car.

Another is sentences involving PROP-deletion, such as:

- (85) John has gone swimming, and Bill has too.

Unlike gapping, PROP-deletion is not restricted to conjoined structures: cf.

- (86) If John has gone swimming, then Bill has too.

## III. DERIVED CONJUNCTION

The basic view adopted here is that all derived conjunction represents a kind of fusion of constituents of conjoined sentences. This fusion may occur whether or not there is identity between parts of the conjoined sentences. Thus constituents of the structures underlying each of the following sentences may undergo fusion:

(87) John sang and Mary sang.

(88) John sang and Mary danced.

In the case of (87), the ultimate result may be:

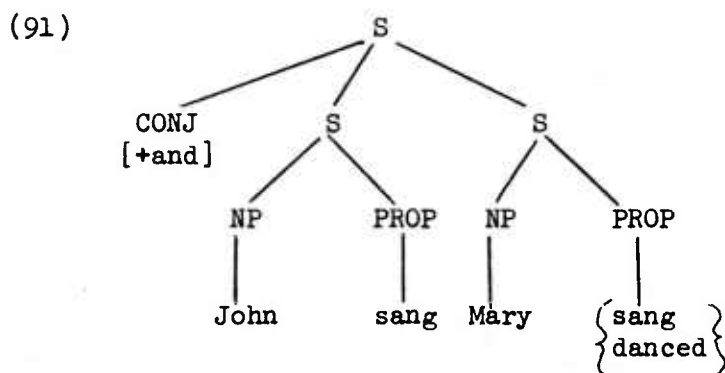
(89) Both John and Mary sang.

(It may also be John and Mary both sang, John and Mary each sang, or John and Mary sang.) In the case of (88), it may be:

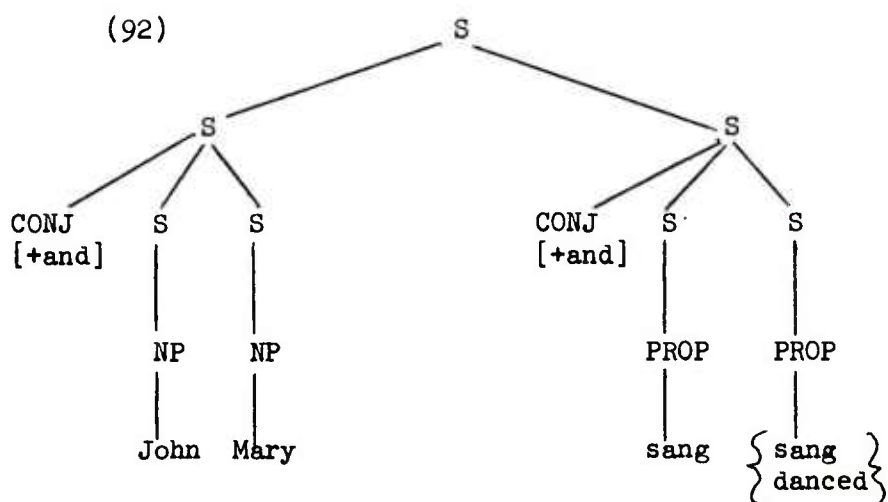
(90) John and Mary sang and danced respectively.

(It may also be John and Mary respectively sang and danced.)

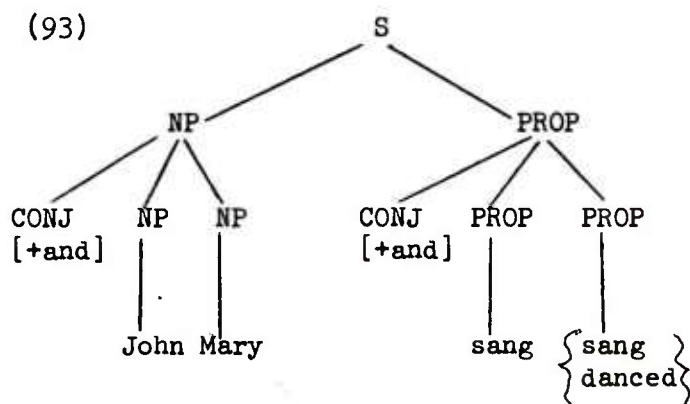
There are a number of rules and rule schemata involved in the derivation of (89) from (87) and (90) from (88), and not all of these rules and schemata apply in both cases. However, there are two fundamental schemata, the Derived Conjunction schema and the Node Relabeling schema, that do apply to both (87) and (88). Let us assume that the structure of (87) and (88) before the application of the Derived Conjunction schema is, roughly:



(For an explanation of the position of the conjunction in the above structure, cf. Note d, Base Rule 1.) The Derived Conjunction schema optionally changes (91) to:



Then the Node Relabeling schema obligatorily changes (92) to:

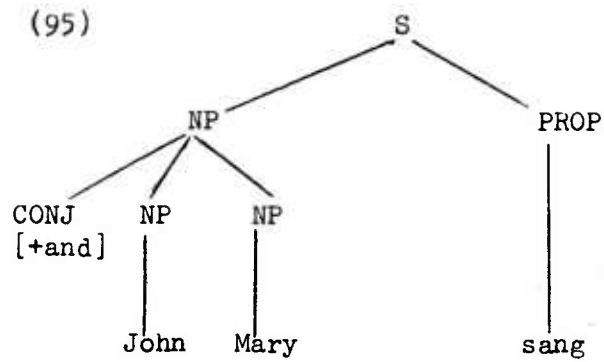


(In some cases, the Node Relabeling schema is inapplicable to one of the sets of conjoined S's that result from application of the Derived Conjunction schema. For example, in the derivation of:

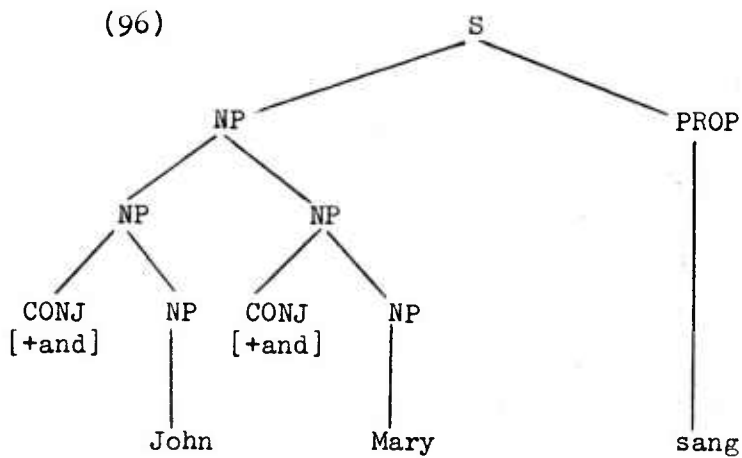
- (94) John bought, and Mary sold, a house and a car respectively.

the Node Relabeling schema does not apply to John bought/Mary sold, which remains labeled as a set of conjoined S's in the surface structure, although it does apply to a house/a car, which is not labeled as an S in the surface structure.)

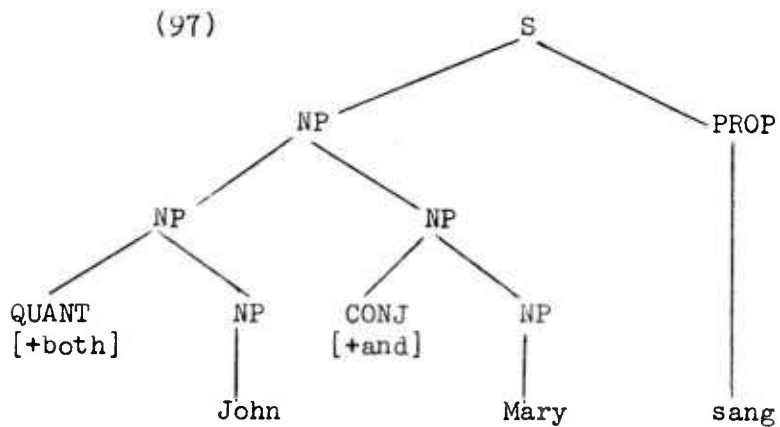
When the second of the conjoined PROP's of (93) dominates sang, the Identical-Conjunct Collapsing schema obligatorily applies, resulting in:



To this the Conjunction Spreading schema obligatorily applies, resulting in:



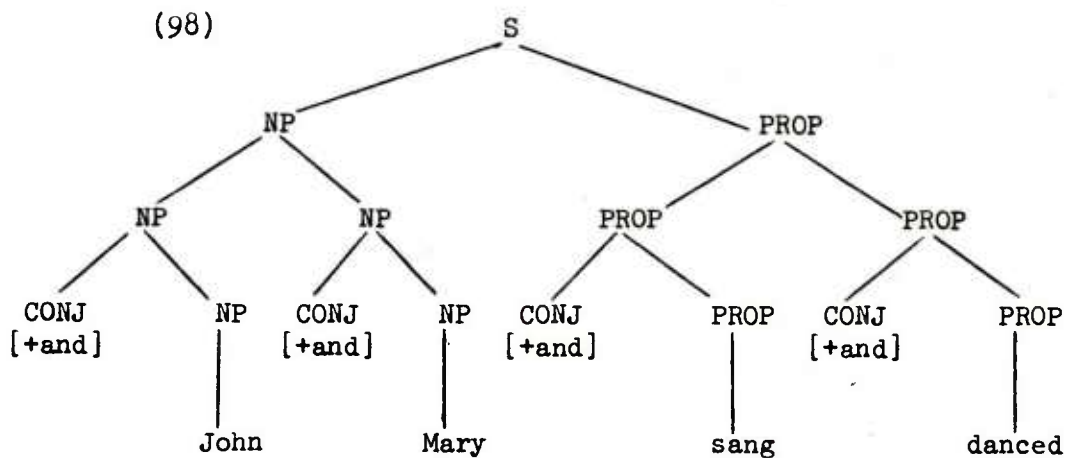
Finally, through application of the optional Both Insertion schema, we derive:



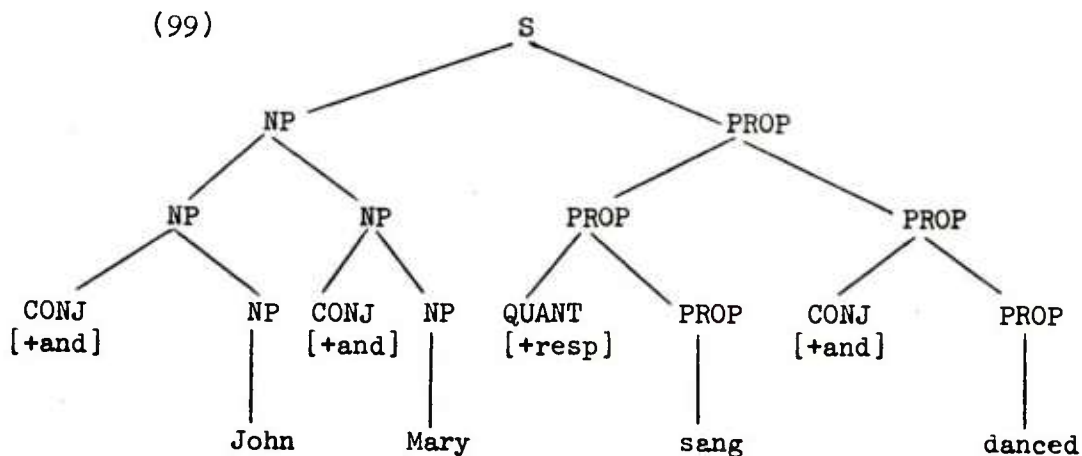


which is the structure that immediately underlies (89). (To derive John and Mary both sang, the Quantifier Movement rule would be applied to (97). To derive John and Mary each sang, the Each Insertion schema and Quantifier Movement rule would be applied to (96). If neither the Both Insertion nor the Each Insertion rule is applied to (96), the Initial-Conjunction Deletion rule applies, resulting in John and Mary sang.)

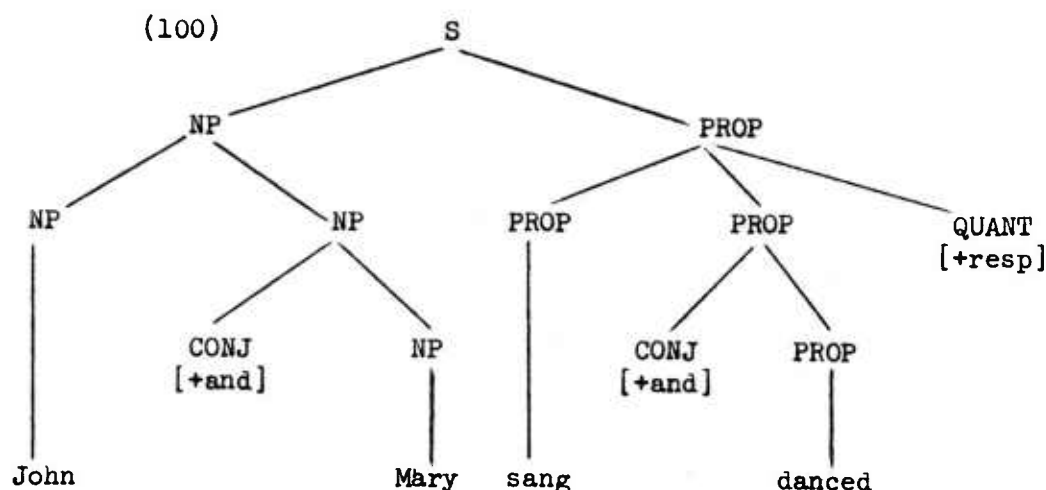
When the second of the conjoined PROP's of (93) dominates danced, the Identical-Conjunct Collapsing schema fails to apply, but the Conjunction Spreading schema obligatorily applies, the result being:



To this the Respectively Insertion schema applies, one of the two possible results being:



(In the second possible result of the application to (98) of the Respectively Insertion schema, the initial and of the NP, rather than that of the PROP, is replaced by respectively. In this case, the resultant sentence is John and Mary respectively sang and danced, rather than (90).) Finally, after application of the Quantifier Movement rule and the Initial-Conjunction Deletion rule, we have:



which is the structure that immediately underlies (90).

Most of the rules and rule schemata relevant to derived conjunction when the underlying conjunction is and have already been mentioned. A more-or-less complete set of the relevant rules and schemata, arranged in order of application, is:

- A. Derived Conjunction
- B. Node Relabeling
- C. Identical-Conjunct Collapsing
- D. Set Marking
- E. Conjunction Spreading
- F. Respectively Insertion
- G. Plural Collapsing
- H. Respectively → Respective and Respectively Deletion
- I. Both Insertion
- J. Either Insertion
- K. All Insertion
- L. Each Insertion
- M. Quantifier Movement
- N. Initial Conjunction Deletion
- O. Medial Conjunction Deletion

A brief account of the effect of those rules and schemata whose functioning has not been previously illustrated may be helpful. The Set Marking rule, then, ultimately accounts for the plural marking of the verb in a sentence such as

- (101) Both John and Mary sing.

The Respectively → Respective rule operates upon certain products of the Respectively Insertion schema to derive such sentences as:

- (102) John and Bill kissed their respective wives.

The Respectively Deletion rule also operates upon certain products of the Respectively Insertion schema to derive such sentences as:

- (103) John and Bill occupy seats at the Captain's table. (Cf. the ungrammatical (104) and the grammatical (105):
- (104) \*John and Bill respectively occupy seats at the Captain's table.
- (105) John and Bill respectively occupy those seats at the Captain's table.

The Plural Collapsing rule accounts for such cases as the derivation of:

- (106) John and Bill bought houses.

- (107) John bought  $\left\{ \begin{array}{l} \text{a house} \\ \text{houses} \end{array} \right\}$  and Bill bought  $\left\{ \begin{array}{l} \text{a house.} \\ \text{houses.} \end{array} \right\}$

The All Insertion schema (together with the Quantifier Movement rule) is responsible for the all in such sentences as:

- (108) John and Mary and Susan all sang.

Finally, the Medial-Conjunction Deletion schema operates, for example, upon (108) to derive:

- (109) John, Mary, and Susan all sang.

The rules and schemata listed above are those that may apply when the conjunction in the underlying structure is and. When the conjunction is but or or, only a subset of these rules and schemata

may apply. In the case of but, the subset consists of A through D and N. In the case of or, the applicable rules and schemata are A through D, N, O, and, additionally, the Either Insertion rule (J), which is applied in the derivation of sentences such as:

(110) She suspected either Harry or Bob.

(111) Either John or Mary sang.

(The Either Insertion schema is quite similar to the Both Insertion schema and it would be possible to combine the two into a single schema, although this has not been done in the present treatment.)

A detailed presentation of the various rules and schemata mentioned above follows.

#### A. The Derived Conjunction Schema (optional)

Gleitman, Schane, and others who have worked on constructions involving primary derived conjunction (i.e., derived conjunction in which all of the conjuncts are whole single constituents) have noted that the device by means of which constructions of this type are generated must provide for a certain type of structure building. Specifically, the device must provide for the insertion, over a set of conjoined single constituents, of a node of the same type as the individual members of the set. Thus, in the course of the derivation of:

(112) John and Mary sang.

from:

(113) John sang and Mary sang.

an NP node must be inserted over John and Mary. Such an insertion is required not only on intuitive grounds--i.e., John and Mary is, intuitively, the subject NP of (112), just as John and Mary are, intuitively, subject NP's in (113) but also on syntactic grounds. For example, John and Mary must be treated as a (plural) NP in the pronominalization rules that derive:

(114) John and Mary sang, and they danced too.

from:

- (115) John and Mary sang, and John and Mary danced too.

Since the device that generates sentences like (112) must provide for structure building of the type just discussed, it seems clear that this device must have power beyond that of the usual set of elementary transformations. Suggestions about what this device may be have been made by Schane, who has proposed a special schema for derived conjunction, and by Ross, who has proposed handling derived conjunction by adding "node raising" (Chomsky adjunction) and certain special pruning and relabeling conventions to the usual set of elementary transformations. (The approach that we take here has features in common with both Schane's proposal and Ross's.)

While a number of scholars have recognized the need for some fairly powerful device for generating primary derived conjunction, most scholars who have considered secondary derived conjunction (i.e., derived conjunction in which not all of the conjuncts are whole single constituents) have assumed that there is no need for such a powerful device in this case. Gleitman, and Schane, for example, have suggested that a simple deletion transformation may suffice to derive a sentence such as:

- (116) John bought, and Mary sold, a house.

from:

- (117) John bought a house, and Mary sold a house.

As was pointed out above, however, (cf. II.C), a treatment of constructions involving secondary conjunction as products of simple deletion transformations is deficient in two important respects: (a) failure to generate derived structures that correctly predict intonation; and (b) failure to provide an account of the occurrence of such quantifiers as respectively in certain constructions involving "secondary" conjunction: e.g.,

- (118) John bought, and Mary sold, a house and a car respectively.

Furthermore, in examples such as (116) and (118), it seems that a kind of structure building similar to that found in primary conjunction is involved. Thus, if we wish to say that the highest IC break in (118) comes between sold and a (as is indicated by the intonation), then we must conclude that there is a node to which John bought, and Mary sold has an "is a" relationship, and another to which a house and a car respectively has such a relationship.

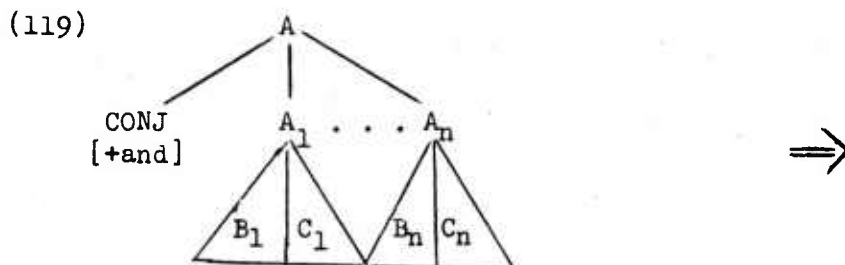
It is for such reasons that we (following Ross) propose a uniform derivation for those constructions that have, in some other treatments, been distinguished as primary and secondary conjunction. Our proposal involves, as the first step in the generation of all constructions involving derived conjunction, a Derived Conjunction schema, and as the second step, a Node Relabeling schema. Application of the Derived Conjunction schema is optional. (If the schema is not applied, the potential inputs to the schema are ultimately realized as conjoined sentences.) However, if the Derived Conjunction schema is applied, the Node Relabeling schema must apply in all cases.

The Derived Conjunction schema operates somewhat differently according to whether the underlying conjunction is and, but, or or. In our initial exposition of the operation of the schema, we shall deal only with its operation when the underlying conjunction is and, temporarily deferring an account of the special properties of the schema when the underlying conjunction is but or or. To facilitate exposition, we shall also temporarily defer an account of the various conditions that must be imposed on the operation of the schema (with and) in order to ensure that it generates only well-formed and correct derived structures. Our exposition will take the following form:

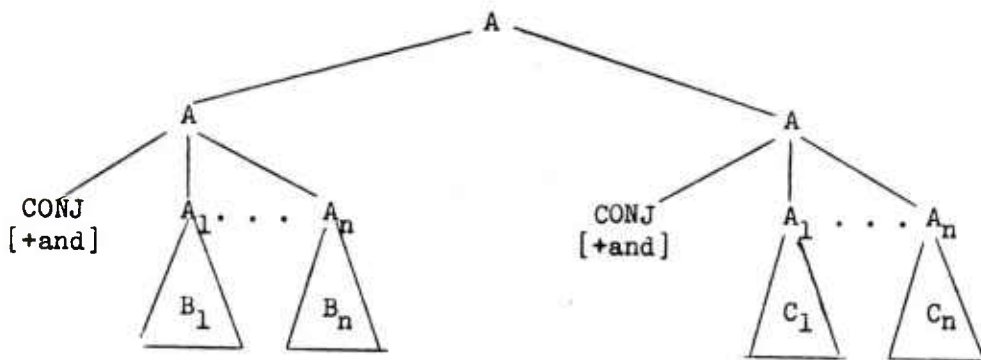
1. Derived And-Conjunction
2. Conditions on Derived And-Conjunction
3. Derived But- and Or-Conjunction

#### 1. Derived And-Conjunction

When the underlying conjunction is and, the Derived Conjunction schema has the following form:

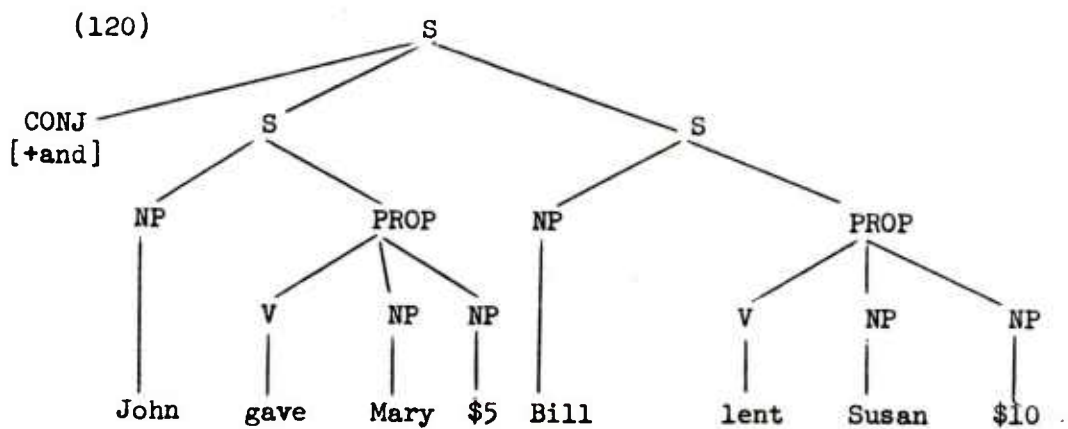






Where  $B_1 \frown C_1$  is a proper analysis of  $A_1$ ,  $B_n \frown C_n$  is a proper analysis of  $A_n$  (and where various other conditions specified in Section 2, below, are met)

This schema can operate upon, e.g.,

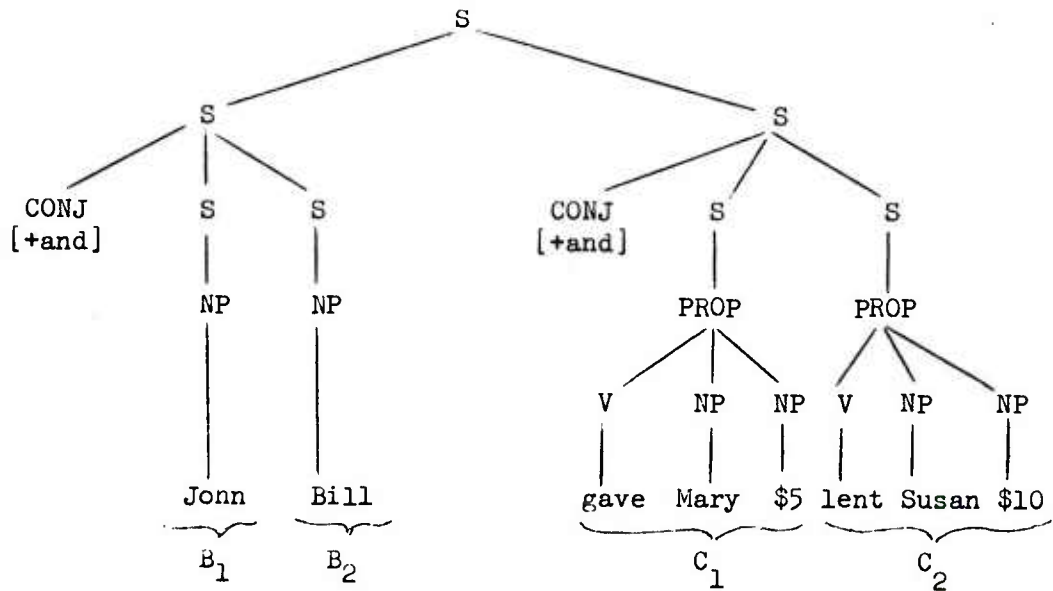


in a number of different ways, depending upon how the conjoined S's of (112) are analyzed into the B's and C's of the schema. For example, operating upon the following analyses of (120):

- (121) (a)  $\underbrace{\text{John}}_{B_1} \underbrace{\text{gave Mary \$5}}_{C_1} \underbrace{\text{Bill}}_{B_2} \underbrace{\text{lent Susan \$10}}_{C_2}$
- (b)  $\underbrace{\text{John gave}}_{B_1} \underbrace{\text{Mary \$5}}_{C_1} \underbrace{\text{Bill lent}}_{B_2} \underbrace{\text{Susan \$10}}_{C_2}$

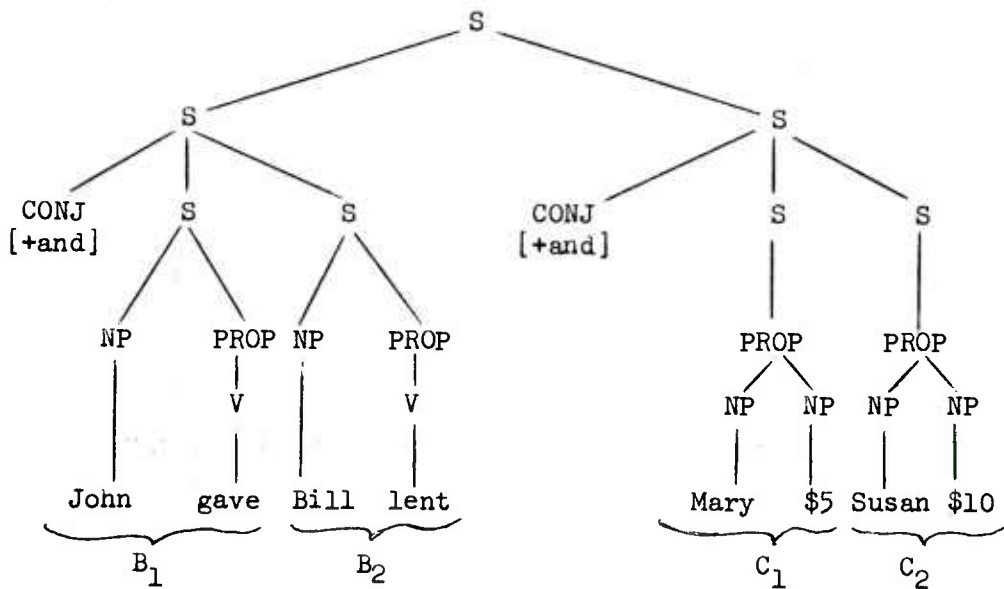
the schema generates, respectively:

(122)



(Ultimately: John and Bill gave Mary \$5 and lent Susan \$10 respectively, or John and Bill respectively gave Mary \$5 and lent Susan \$10.)

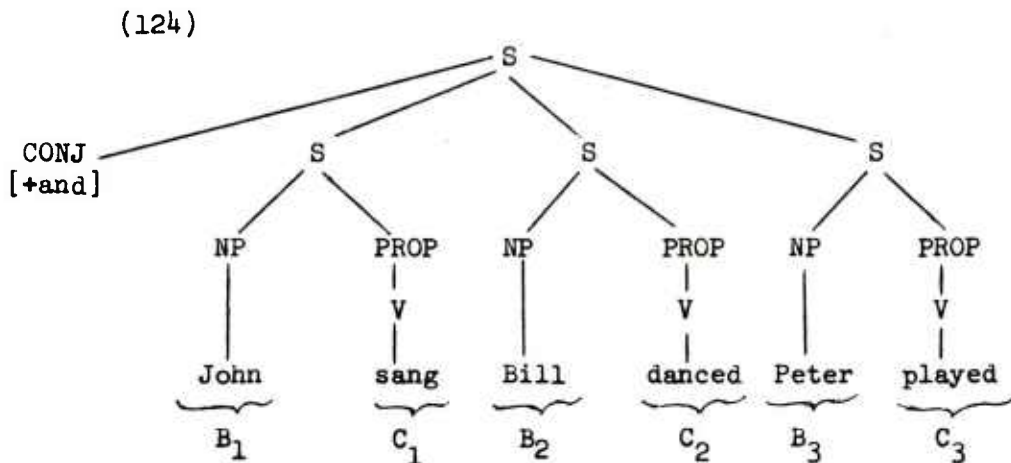
(123)



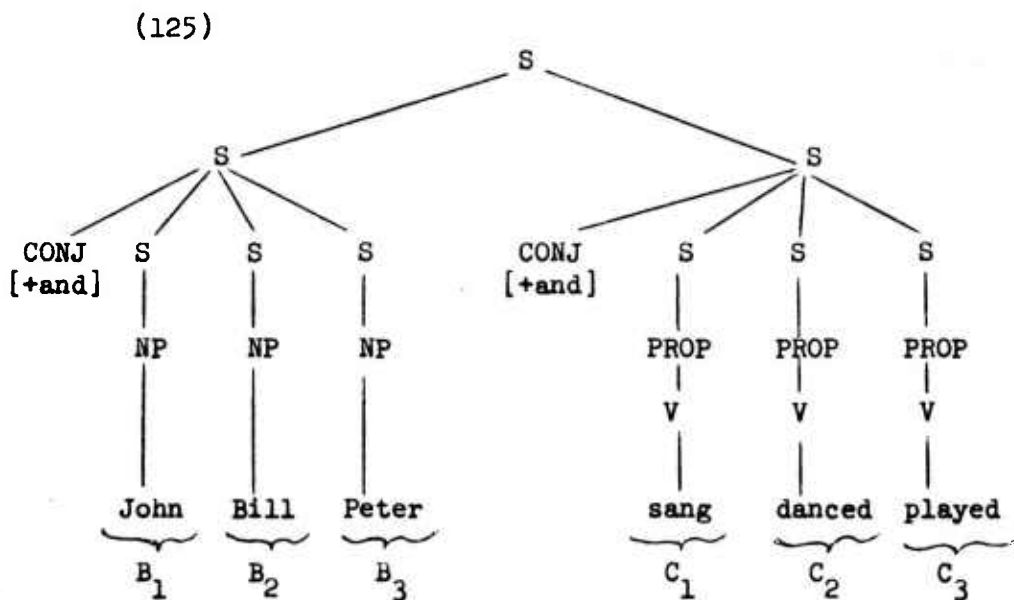
(Ultimately: John gave, and Bill lent, Mary \$5 and Susan \$10 respectively.)

(The trees (122) and (123), like all trees that result from the Derived Conjunction schema, must undergo Node Relabeling--see below--which considerably simplifies them.)

The schema may operate upon more than two conjoined S's. Thus, for example, given as input a structure like:



the schema generates:

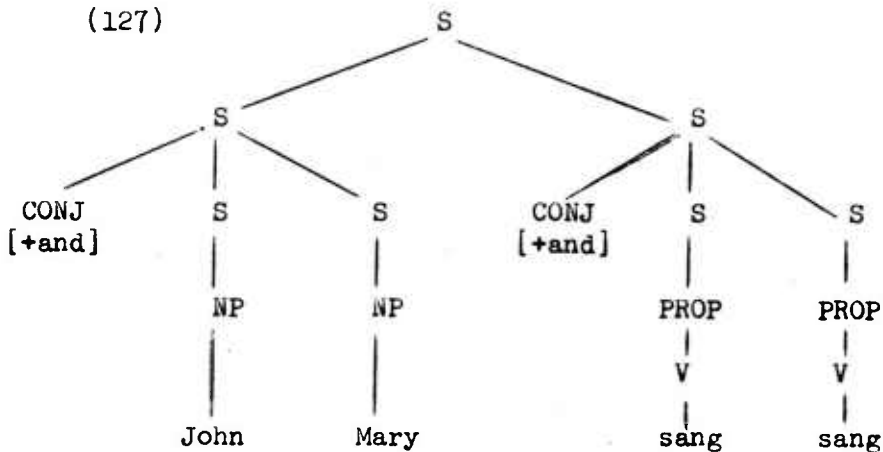


(Ultimately: John, Bill, and Peter sang, danced, and played respectively, or John, Bill, and Peter respectively sang, danced, and played.)

Examples of the operation of the schema thus far have all resulted in structures to which the Respectively-Insertion rule (cf. III.F, below) applies. Given other conjoined sentences as inputs, however, the resultant structures may be candidates for the optional insertion of other quantifiers. Thus the schema would operate upon the structure underlying:

(126) John sang and Mary sang.

to yield the derived tree:

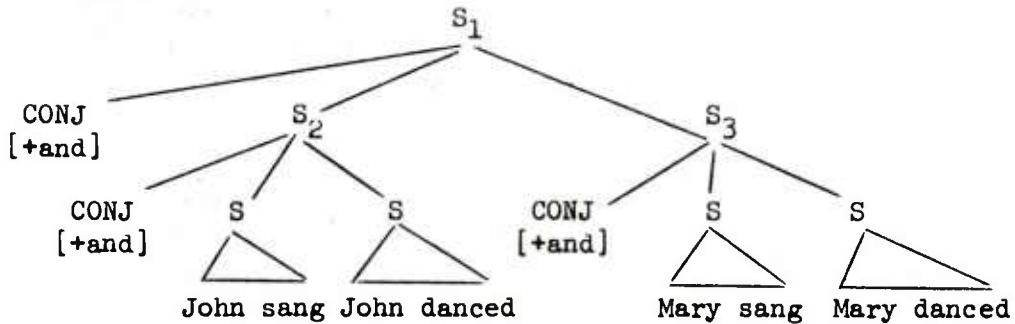


Ultimately, this tree would be realized as one of the following:

- (128) (a) Both John and Mary sang.  
 (b) John and Mary both sang.  
 (c) John and Mary each sang.  
 (d) John and Mary sang.

In cases where the base rules have generated a set of conjoined S's one or more of which dominates a set of conjoined S's, the Derived Conjunction schema applies first to the more deeply embedded set(s). Then, after the entire cycle of schemata and rules relevant to conjunction has been applied to the more deeply embedded set(s), the schema may again be applied to the less deeply embedded set. For example, given the underlying structure:

(129)

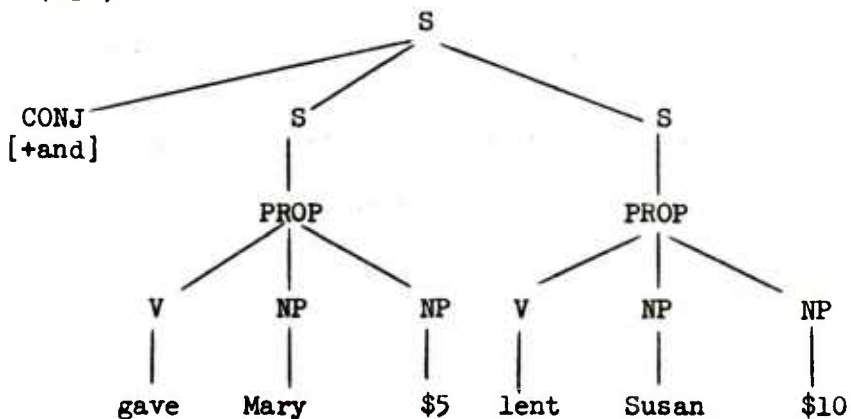


the cycle of conjunction schemata and rules is applied first to the sets of conjoined S's dominated by  $S_2$  and  $S_3$ , then to the set dominated by  $S_1$ . Ultimately, the resultant sentence may be one of the following (among others):

- (130) (a) Both John and Mary sang and danced.  
 (b) Both John and Mary both sang and danced.  
 (c) John and Mary each both sang and danced.  
 (d) John and Mary sang and danced.

It is also possible that the application of the Derived Conjunction schema may itself result in a structure to which the schema is applicable. The right-hand side of the tree of (122), i.e.:

(131)

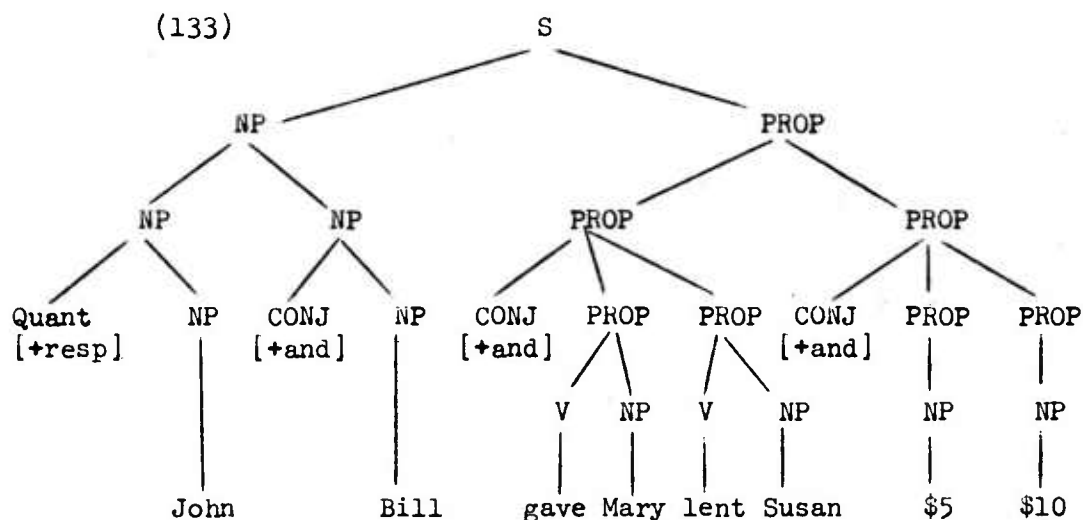


is such a case. The subtree (131) may be analyzed into the B's and C's of the schema in either of the following ways:

- (132) (a) gave Mary \$5 lent Susan \$10  
                   B          C          B          C
- (b) gave Mary \$5 lent Susan \$10  
                   B          C          B          C

In such cases, the Derived Conjunction schema does not actually operate directly upon a tree such as (122), since the entire cycle of conjunction schemata and rules (except, we shall assume, for Quantifier Movement and Initial- and Medial-Conjunction Deletion) will have applied to the conjoined structure of (122) before the Derived Conjunction schema can be re-applied to such analyses of the conjoined PROP's of (131) as (132).)

If we take the analysis (132.a), the result of the application of the schema to (122) (as modified by subsequent schemata and rules in the conjunction cycle) is:



After all relevant schemata and rules are applied to the conjoined PROP's of (133), the ultimate result is either (134.a) or (134.b).

- (134) (a) John and Bill respectively gave Mary and  
                   lent Susan \$5 and \$10 (respectively).  
       (b) John and Bill respectively gave Mary and  
                   lent Susan (respectively) \$5 and \$10.



It is assumed here that in all cases where more than two sets of conjuncts occur in a derived structure, the Derived Conjunction schema has been re-applied. Thus, in deriving from the structure underlying:

(135) John will sing and Bill won't dance

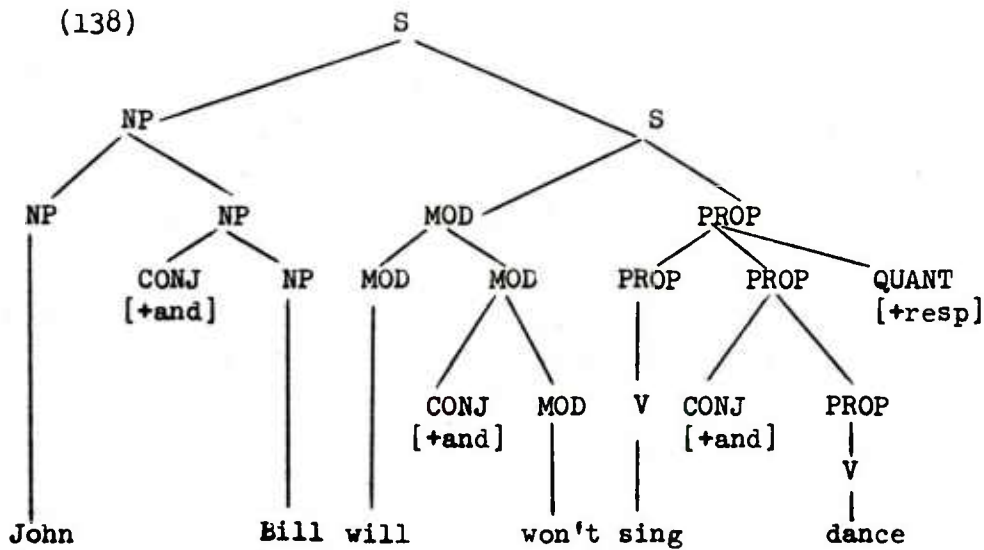
the sentence:

(136) John and Bill will and won't sing and dance respectively.

the schema will first derive the structure underlying either (137.a) or (137.b):

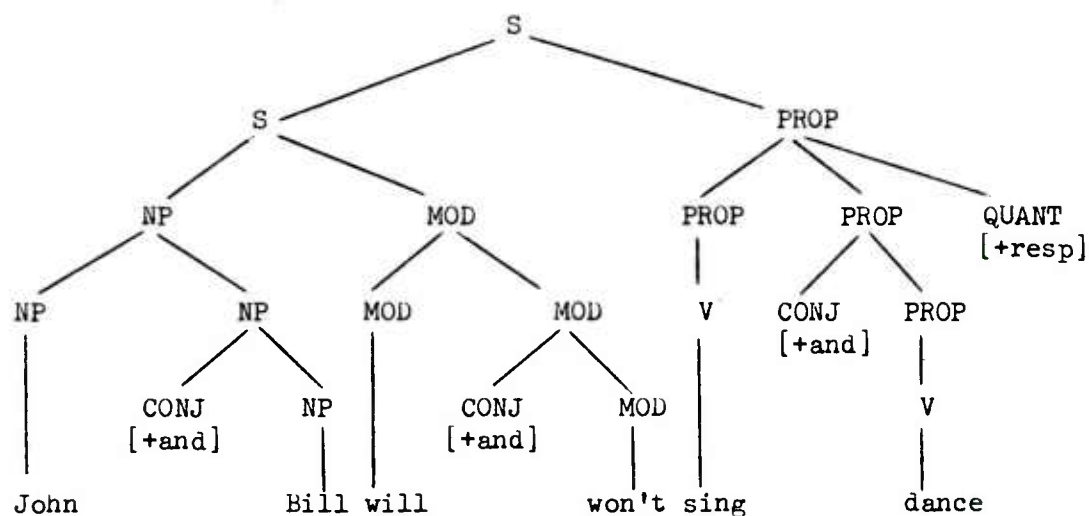
- (137) (a) John and Bill will sing and won't dance respectively.  
 (b) John will, and Bill won't, sing and dance respectively.

If (136) is derived by way of (137.a), its ultimate derived structure is:



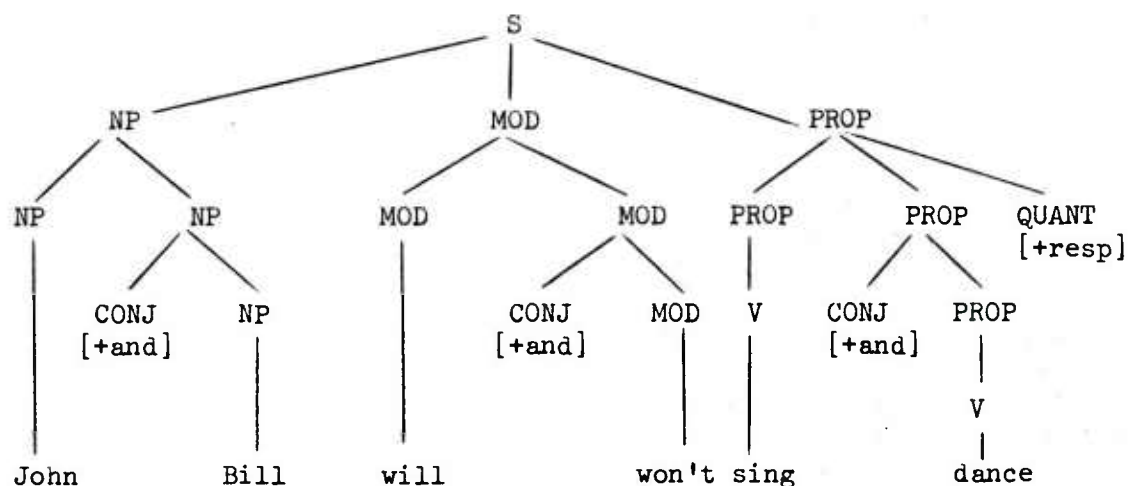
If it is derived by way of (137.b), its ultimate derived structure is:

(139)

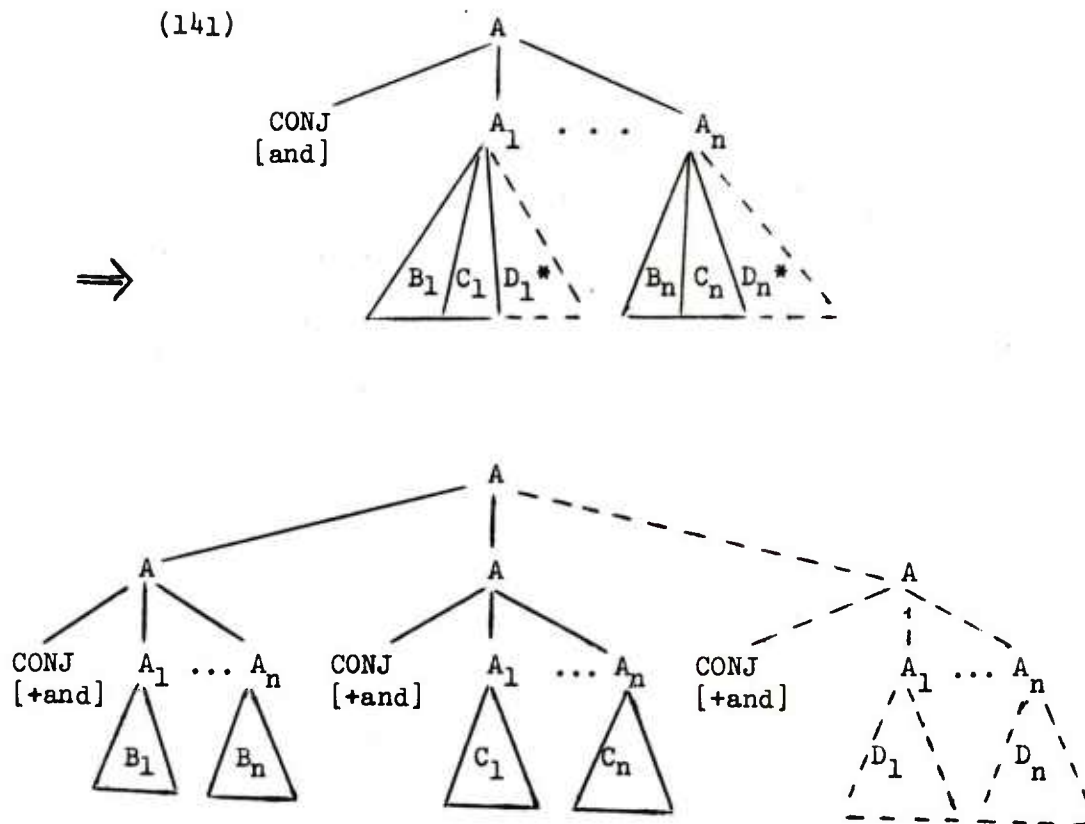


Thus the schema, in its present form, will not generate (134) with the derived structure (140):

(140)



If structures such as (140) are possible, then it is necessary to replace the schema of (119) with something like the following:



We do not, however, feel that this change is clearly motivated, and so, since adopting (141) would entail considerable complication of subsequent rules, we have chosen to adopt the schema of (119) instead.

## 2. Conditions on Derived And-Conjunction

Unless various conditions are imposed on the operation of the Derived Conjunction schema (119), it may be used to generate both ungrammatical strings and grammatical strings with incorrect derived structures. An example of the use of the schema to generate an ungrammatical string would be an analysis of the tree (20)) (whose bottom line is John gave Mary \$5 Bill lent Susan \$10) into the B's and C's of the schema as follows:

(142) John gave Mary \$5 Bill lent Susan \$10

B
C
B
C

Such an analysis would result, ultimately, in:

- (143) \*John gave and Bill Mary \$5 and lent Susan \$10 respectively.

An example of the use of the schema to generate a grammatical string with an incorrect derived structure would be an analysis of the tree underlying:

- (144) Large flags were flying and small flags were flying.

into the B's and C's of the schema as follows:

- (145)  $\underbrace{\text{large}}_B \underbrace{\text{flags were flying}}_C \underbrace{\text{small}}_B \underbrace{\text{flags were flying}}_C$

This would permit the generation of the grammatical string:

- (146) Large and small flags were flying.

with a derived structure in which the highest constituent-break comes between small and flags, rather than, as is appropriate, between flags and were.

In order to avoid undesirable applications of the schema as in (142) and (145), a number of conditions must be imposed on the ways in which structures may be analyzed into the B's and C's of the schema. For the purposes of explicating these conditions, we shall adopt the following notational conventions, which pertain to the left-hand tree of (119):

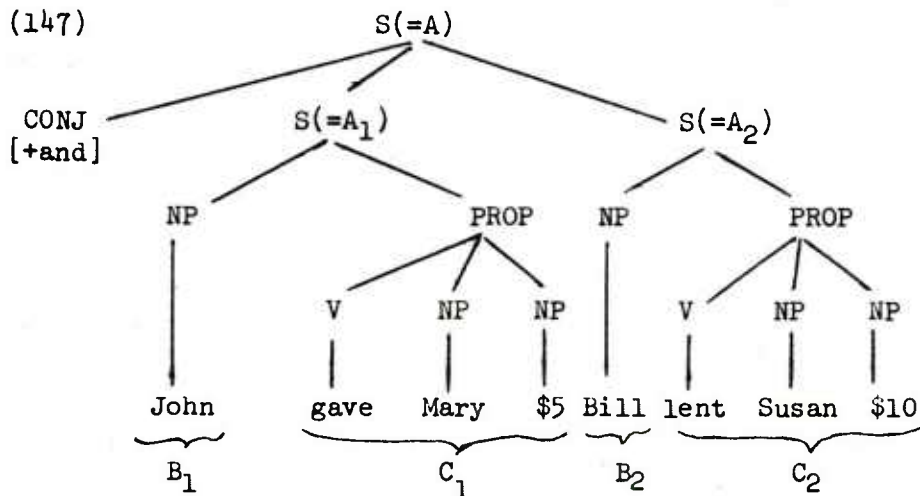
- A = any member of the set  $\{A_1 \dots A_n\}$   
 B = any member of the set  $\{B_1 \dots B_n\}$   
 C = any member of the set  $\{C_1 \dots C_n\}$

(If a condition refers to A and/or B and/or C, it is to be understood that reference is to all A's and/or B's and/or C's with the same subscript.)

- $\{A\}$  = the set  $\{A_1 \dots A_n\}$   
 $\{B\}$  = the set  $\{B_1 \dots B_n\}$   
 $\{C\}$  = the set  $\{C_1 \dots C_n\}$

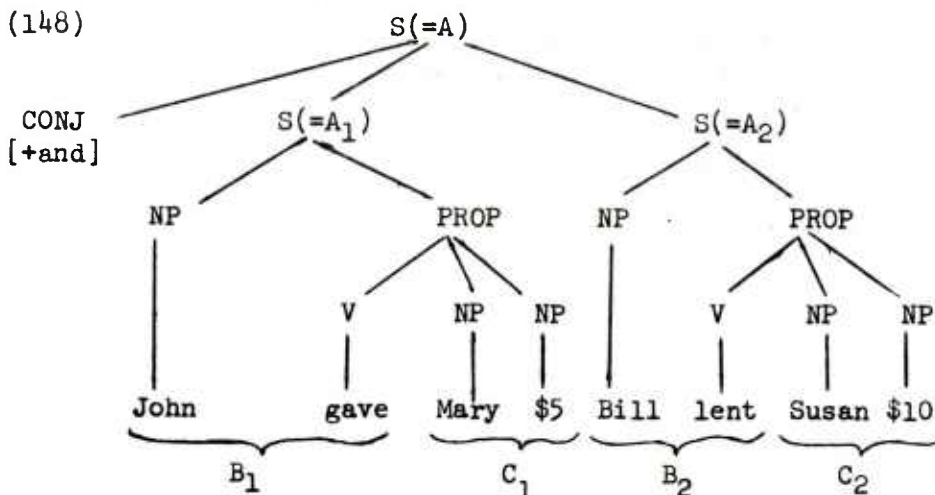
Condition (a):  $\widehat{BC}$  is a proper analysis of A, except that any node dominated by A that dominates constituents of both B and C is included in both B and C.

This condition makes a distinction between that has been called primary conjunction (in which only A dominates constituents of both B and C) and secondary conjunction (in which some node dominated by A dominates constituents of both B and C). For example, if we examine the following analysis of the tree (120) into the A's, B's, and C's of the schema:



we see that there is no node below  $A_1$  which dominates constituents of both  $B_1$  and  $C_1$  and no node below  $A_2$  which dominates constituents of both  $B_2$  and  $C_2$ . This is a case in which the resultant sentence (John and Bill gave Mary \$5 and lent Susan \$10 respectively) involves primary conjunction, and Condition (a) tells us that in all such cases  $\widehat{BC}$  is a proper analysis of A.

If, on the other hand, we examine the following, alternative analysis of the tree (120):



we see that there is a node below  $A_1$  (namely, PROP) which dominates constituents of both  $B_1$  and  $C_1$ , and, similarly, there is a node below  $A_2$  (again PROP) which dominates constituents of both  $B_2$  and  $C_2$ . This is a case in which the resultant sentence (John gave, and Bill lent, Mary \$5 and Susan \$10 respectively) involves secondary conjunction, and Condition (a) tells us that in all such cases  $B \hat{C}$  is not strictly a proper analysis of A, since there is a single node dominated by A (the node that dominates constituents of both B and C) which must be included in both B and C. In the case of the application of the schema to (148), Condition (a) is responsible for the occurrence of the PROP node four times in the derived tree (123) (cf. p. 41) where it was present only twice in the underlying tree ((120) or (148)). The condition thus ensures, for example, that after Node Relabeling has applied to (123), Mary \$5 (and) Susan \$10 will be identified as a derived PROP consisting of two conjoined (partial) PROP's, Mary \$5 and Susan \$10. This, in turn, permits the proper insertion of and between the two conjoined PROP's, by means of the Conjunction Spreading schema.

In the case of the application of the schema to (147), on the other hand, Condition (a) ensures that the derived tree (122), has no more occurrences of nodes included in B and C than does the underlying tree.

Condition (b):  $B \hat{C}$  includes all nodes of A.

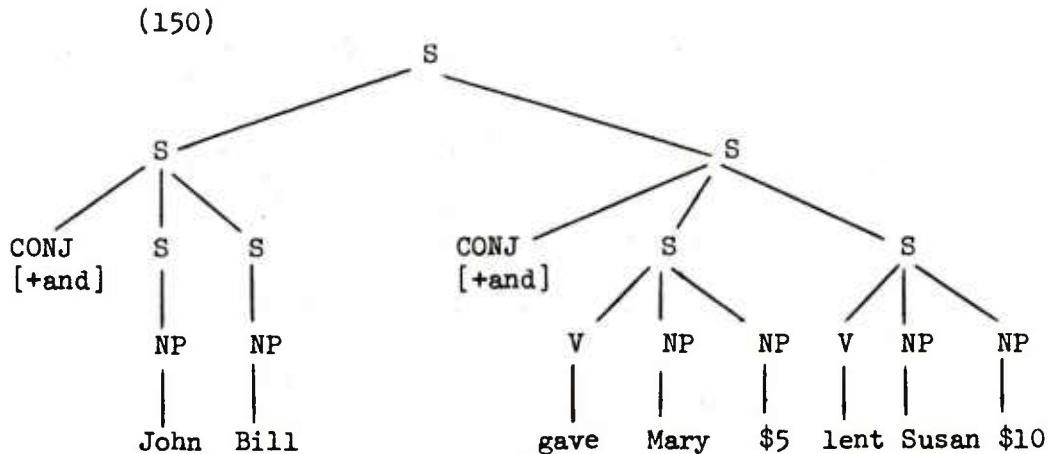
While Condition (a) specifies that  $B \hat{C}$  must be, with stated exceptions, some proper analysis of A, it does not in itself impose any limitations on which proper analyses of A are appropriate. Condition (b) is one of several conditions which impose appropriate limitations. For example, in applying the schema to the analysis of (120) represented in (147), one wants to ensure that the PROP nodes dominating gave Mary \$5 and lent Susan \$10 are present in the derived tree. Yet the PROP nodes need not be mentioned in a proper analysis of the  $A_1$  or  $A_2$  of (147). Thus (149.a) is as much a proper analysis of the  $A_1$  of (147) as is (149.b).

(149) (a)  $NP \hat{V} \hat{NP} \hat{NP}$

(b)  $NP \hat{PROP}$

If the C's of (147) were permitted, for purposes of the Derived Conjunction schema, to be given the proper analysis  $V \hat{NP} \hat{NP}$ , as in (149.a), then the derived structure, instead of the appropriate (122), would be the inappropriate (150):

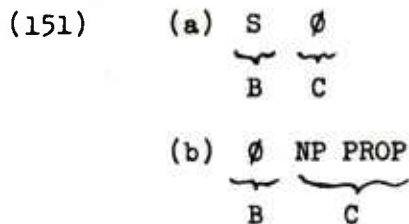




Given this derived structure, Node Relabeling would fail to apply to the right-hand side of the tree, so that, in the ultimate derived structure, gave Mary \$5 and lent Susan \$10 (respectively) would remain identified as an S composed of two conjoined S's, rather than, as is appropriate, a PROP composed of two conjoined PROP's. Condition (b) excludes this possibility. Similarly, in a more detailed tree than (147), John, Bill, etc. would be identified not only as NP's but as DET<sup>~</sup>N's (where DET =  $\emptyset$ ). Condition (b) would exclude derived trees in which John, Bill, etc. are identified only as DET<sup>~</sup>N's and not as NP's as well.

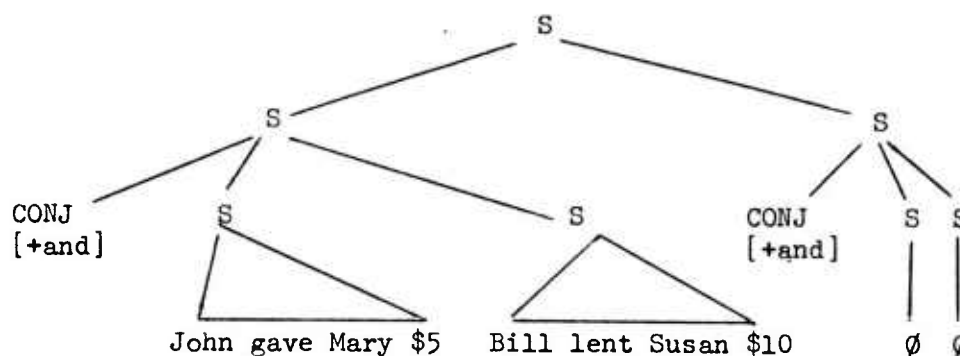
Condition (c): No B or C is null.

Without this condition, the following would be possible analyses of the  $A_1$  or  $A_2$  of (147) into the B's and C's of the schema:



Obviously one does not wish the schema to operate with such analyses, which would give rise to derived trees such as:

(152)



Condition (c) excludes such possibilities.

Condition (d): The members of  $\{B\}$  or the members of  $\{C\}$  are not totally identical.

This condition (if it is correct--see below) excludes the (ultimate) derivation of, e.g., (153.b) or (153.c) from (153.a), while permitting the derivation of (154.b) from (154.a) and the derivation of either (155.b) or (155.c) from (155.a).

- (153) (a) The man worked and the man worked.  
 (b) The man worked.  
 (c) The men worked.
- (154) (a) The man worked and the woman worked.  
 (b) The man and the woman worked.
- (155) (a) The man worked and the man played.  
 (b) The man worked and played.  
 (c) The men worked and played respectively.

(Sentence (155.c) may seem questionable, but it is acceptable in a context in which the referents of the men have already been established: e.g.,

- A. What did John, Bill, and Mary do yesterday?  
 B. The men worked and played respectively  
 (and Mary slept).)

In considering the need for this condition, we may question both whether it achieves its stated goal (i.e., whether it excludes such derivations as that of (153.b) and (153.c) from (153.a) without inappropriately excluding other derivations) and whether this goal is an altogether correct one.

As far as the exclusion of the derivation of (153.b) from (153.a) is concerned, we may note, first, that perhaps, if "totally identical" is taken to include referential as well as formal identity, then conjunctions of "totally identical" S's should be excluded on the level of deep structure. Thus, while it is possible to interpret the two occurrences of the man in (153.a) as coreferential, as in:

- (156) The man worked and the man worked, and  
finally he achieved his goals.

it may be the case that what is involved in (153.a), when it is interpreted in this way, and in (156), is not conjunction at all but, rather, some kind of emphatic reduplication, which, like conjunction, happens to involve and. (Note, however, that like genuine conjunction, this emphatic-reduplication structure does permit some "conjunction reduction", as in:

- (157) The man worked and worked.)

If, then, (153.a) is excluded, in its coreferential interpretation, on the level of deep structure, no special condition on derived conjunction is required to exclude the derivation of (153.b) from it.

To turn to the non-coreferential interpretation of (153.a) (an interpretation for which the insertion of other before the second occurrence of man may be obligatory), we may ask, first, whether Condition (d), in excluding the derivation of (153.c) from (153.a), also excludes certain other derivations that should be permitted, and second, whether the derivation of (153.c) from (153.a) should, in fact, be excluded.

The answer to the first of these questions is clearly affirmative. Note that, in order for Condition (d) to apply to (153.a) in its non-coreferential interpretation, "totally identical" must be taken to mean "formally identical but not referentially identical". But, with this interpretation, the condition would exclude such needed derivations as that of (158.b) from (158.a) or (159.b) from (159.a):

- (158) (a) John (Smith) worked and John (Jones) worked.
- (b) John and John both worked.
- (159) (a) I went to Washington (D.C.) and Washington (State).
- (b) I went to both Washington and Washington.

Therefore, Condition (d), if it is to exclude the derivation of (153.c) from (153.a) but permit the derivation of (158.b) and (159.b), must in any case be amended to something like:

Condition (e): The members of  $\{B\}$  or  $\{C\}$  are not totally identical, except where either  $\{B\}$  or  $\{C\}$  includes a proper noun.

But, to turn to the second question, is it correct to exclude the derivation of (153.c) from (153.a), by means of Condition (d), Condition (e), or any other condition? The reason for wishing to exclude such a derivation is that, in the present grammar, plural nouns may be introduced directly into deep structures from the lexicon. Since this is so, were we also to permit derivations like that of (153.c) from (153.a), we would be generating most plural nouns in either of two ways: by direct insertion from the lexicon, or by derived conjunction. (Some plural nouns, e.g., the men in (155.c), when interpreted as derived from the conjunction of two formally-identical singular nouns, as in (155.a), would still be derived in only one way: by conjunction.) But this would be to predict a curious kind of ambiguity for most plural nouns.

In Section II.B.2, above, we argued that, in principle, we saw nothing to lose, and much to gain, if plurals in general could be derived from underlying conjoined sentences. As we admitted in that section, however, certain practical difficulties arise in attempting to formalize this derivation of plurals, and for this reason we have permitted the direct insertion of plurals from the lexicon. This being so, we require a condition like Condition (e) to exclude unwanted ambiguous derivations.

Condition (f): The members of  $\{B\}$  or the members of  $\{C\}$  are identical with respect to their highest proper analysis.

This condition excludes certain inappropriate analyses of conjoined structures into the B's and C's of the schema. A case in point is the analysis (142) (repeated below), which, if permitted, would give rise to the ungrammatical (143) (\*John gave and Bill Mary \$5 and lent Susan \$10 respectively).

(142)    John gave    Mary \$5    Bill    lent Susan \$10  
                   B                    C                    B                    C

What Condition (f) requires is either that all members of the set  $\{B\}$  be identical with respect to the "highest" proper analyses that characterize them, or that all members of the set  $\{C\}$  be identical in this respect. (The "highest" proper analysis of a structure is that proper analysis none of whose nodes is dominated by a node that occurs in any other proper analysis of the structure. Thus in (147), S is the highest proper analysis of the structure corresponding to John gave Mary \$5, and PROP is the highest proper analysis of the structure corresponding to gave Mary \$5.) It can easily be seen that (142) does not conform to this condition. In (142), the set  $\{B\}$  consists of John gave (whose highest proper analysis (cf. (147)) is  $NP \wedge V$ ) and Bill (whose highest proper analysis is NP), while the set  $\{C\}$  consists of Mary \$5 (whose highest proper analysis is  $NP \wedge NP$ ) and lent Susan \$10 (whose highest proper analysis is PROP). Since in the analysis (31) neither all members of  $\{B\}$  nor all members of  $\{C\}$  are identical with respect to their highest proper analysis, Condition (f) rejects (142), and consequently blocks the derivation of (143).

Note that the condition does not block an analysis in which all members of  $\{B\}$  are identical with respect to their highest proper analysis but all members of  $\{C\}$  are not. Thus the structure underlying (160.a) may be analyzed into the B's and C's of the schema as in (160.b) without violating the condition:

(160) (a) We assembled and we marched for three hours.  
       (b) We    assembled    we    marched for three hours.  
                   B                    C                    B                    C

In (160.b) the B's have identical highest proper analyses (both being NP's) but the C's have different highest proper analyses (assembled being a PROP and marched for three hours a  $PROP \wedge ADV$ ). Since the analysis conforms to condition (f), the schema is applicable to the structure underlying (160.a), the ultimate result being:

(161) We assembled and marched for three hours.

Similarly the structure underlying (162.a) may be analyzed into the B's and C's of the schema as in (162.b) without violating Condition (f):

(162) (a) John has been a good president and people expect Bill to become a good president.

(b) John has been a good president  
                   B                                  C  
  
people expect Bill to become a good president  
   B  C

In (162.b), although the B's have different highest proper analyses, the C's have identical highest proper analyses. Consequently (162.b) conforms to Condition (f), and the structure underlying (162.a) may undergo derived conjunction, the result being:

(163) John has been, and everyone expects Bill to become, a good president.

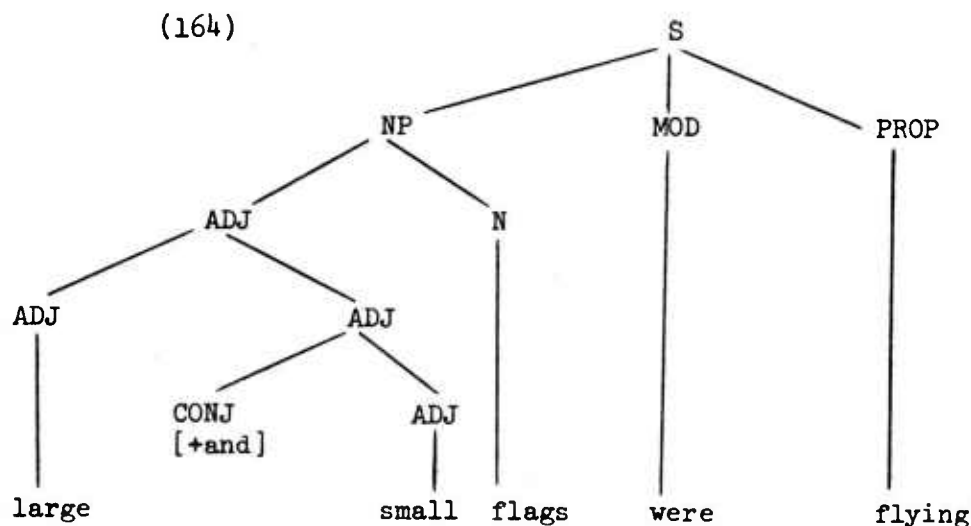
Condition (f) does not, of course, prevent the schema from applying when both all members of the set  $\{B\}$  and all members of the set  $\{C\}$  have identical highest proper analyses, as is the case, for example, with the B's and C's of (147), where the B's are NP's and the C's are PROP's.

Condition (g): The first (or only) constituent of the highest proper analysis of B is an immediate constituent (IC) of A.

This condition, and Condition (h), below, are intended to prevent the assignment of incorrect derived structures to certain types of grammatical strings. In both cases, the effect of the conditions is to give a certain preference to primary conjunction (the conjunction of whole single constituents) over secondary conjunction (the conjunction of non-constituents).



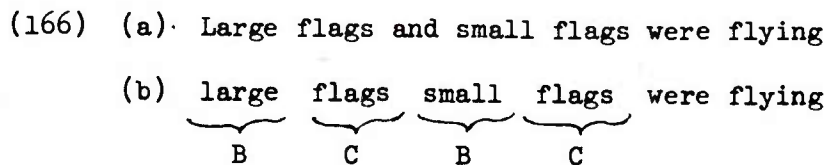
An example pertinent to Condition (g) is the derivation of (146) (Large and small flags were flying) from the structure underlying (144) (Large flags were flying and small flags were flying). The correct derived structure for (146) is, roughly:



Such a structure is derived by analyzing the structure underlying (144) as follows:



From this, we ultimately derive the structure underlying (166.a), part of which may, in turn, be analyzed into the B's and C's of the schema as in (166.b):



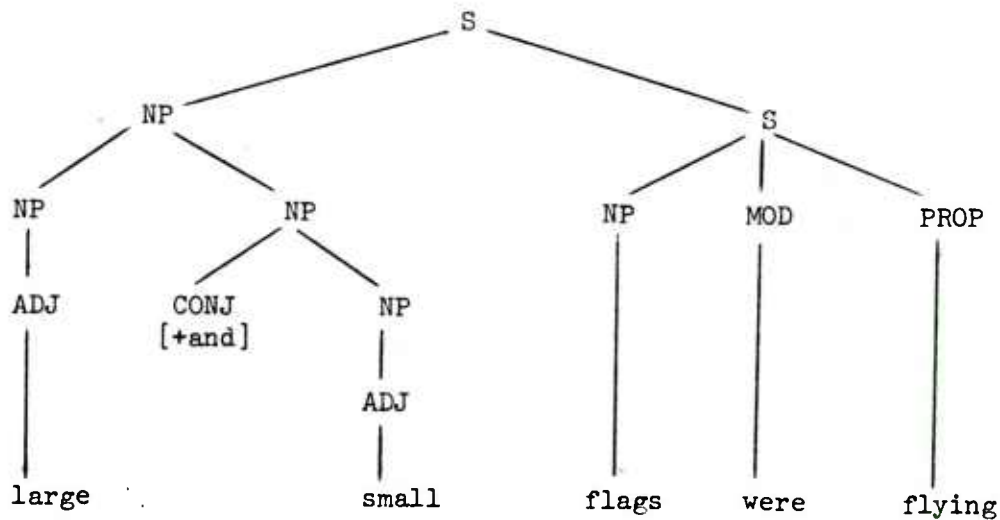
Application of conjunction schemata and rules to the analysis (166.b) ultimately yields (146) with the derived structure (164).

But if we were permitted to analyze the structure underlying (144) as in (145) (repeated below):

(145) large flags were flying small flags were flying  
           B                  C                  B                  C

application of the Derived Conjunction schema, etc. would ultimately generate (146) with the incorrect derived structure (167):

(167)



Condition (g), by preventing analyses like (145) (in which the first constituent of the highest proper analysis of each member of  $\{B\}$  --i.e., ADJ in (145)--is not an IC of  $\{A\}$ ), blocks the generation of derived structures like (167).

Note that, given a structure like that underlying (168):

(168) Yesterday large flags were flying and this morning small flags were flying.

Condition (g) does not prevent the analysis (169):

(169) yesterday large flags were flying this morning small  
           B                  C                  B  
       flags were flying  
           C

This is because, even though the members of the set  $\{B\}$  are not IC's of  $\{A\}$ , the first constituent of the highest proper analysis of each  $B$  is an IC of  $A$ . (That is, the ADV's yesterday and this morning are IC's of their respective S's.) As a result, the analysis (169) is permitted, and the sentence (170) is generated with a derived structure in which the highest IC break comes between small and flags:

- (170) Yesterday large, and this morning small, flags were flying.

It is also evident that we do not wish to impose upon the set  $\{C\}$  restrictions similar to those imposed upon the set  $\{B\}$  by Condition (g): i.e., we do not wish to require that the last (or only) constituent of the highest proper analysis of  $C$  be an IC of  $A$ . Were such a restriction to be imposed, there would be no way of deriving, e.g., (171.c) from the structure underlying (171.a) via the analysis (171.b):

- (171) (a) John likes Jim and Bill tolerates Jim.

- (b)  $\underbrace{\text{John likes}}_B \underbrace{\text{Jim}}_C \underbrace{\text{Bill tolerates}}_B \underbrace{\text{Jim}}_C$

- (c) John likes, and Bill tolerates, Jim.

The Jim's of (171.b) do not include the last IC's of their respective S's, but the above derivation is nonetheless permissible.

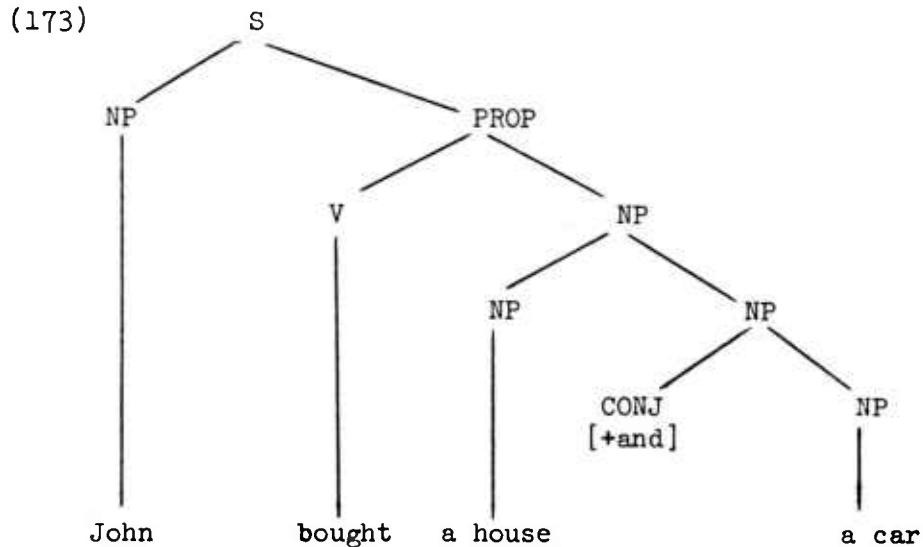
Condition (h): If  $\{B\}$  does not consist of single IC's of  $\{A\}$ , then:

- (a) the members of  $\{B\}$  are not totally identical;
- (b) the constituents of  $\{B\}$  that follow the first IC of  $\{A\}$  are not totally identical.

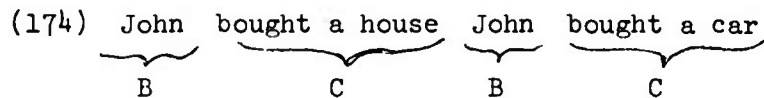
An example pertinent to Condition (h.a) is the derivation of (172.b) from (172.a):

- (172) (a) John bought a house and John bought a car.  
 (b) John bought a house and a car.

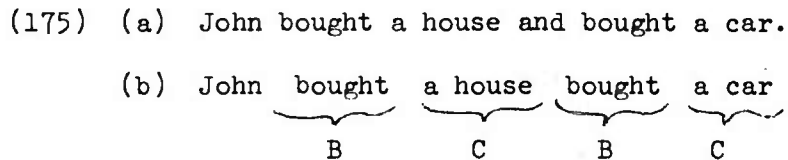
Presumably, the correct derived structure for (172.b) is, roughly:



To derive (172.b) with the structure (173), we begin by analyzing the structure underlying (172.a) as follows:



Various conjunction schemata and rules operate upon the structure so analyzed to derive the structure underlying (174.a), part of which may, in turn, be analyzed into the B's and C's of the schema as in (175.b):

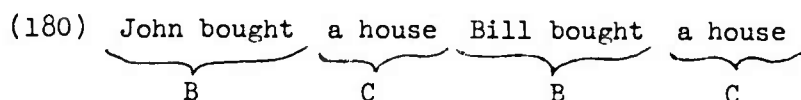


Application of conjunction schemata and rules to the analysis (175.b) ultimately yields (172.b) with the correct derived structure (173).

However, suppose we were permitted to analyze the structure underlying (172.a) as follows:



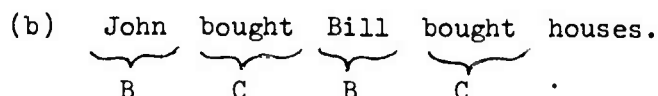
It does this by prohibiting an analysis like (180) of the structure underlying (178.a):



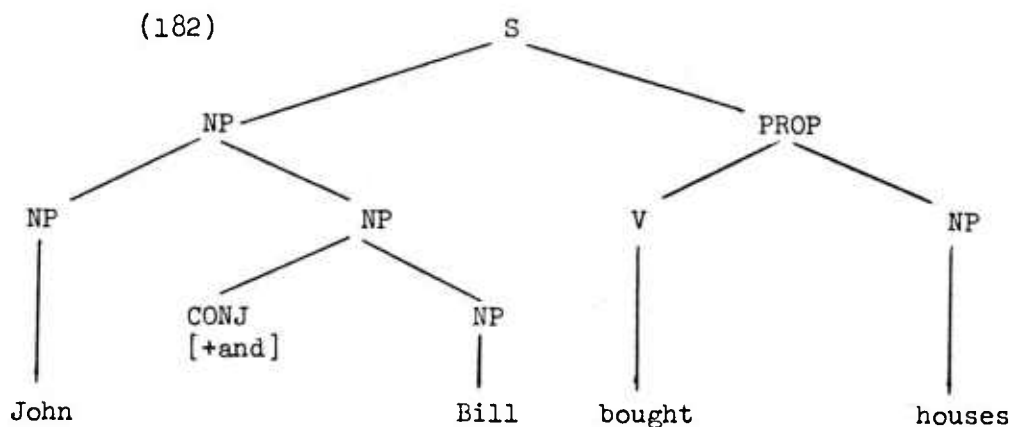
In (180), the  $\{B\}$  's are not single IC's of their respective S's, and the constituents of each B (i.e.,  $v[\text{bought}]$  in each case) that follow the first IC's of the two conjoined S's (i.e.,  $NP[\text{John}]$  and  $NP[\text{Bill}]$  respectively) are identical. Hence (180) violates Condition (h.b).

Were the analysis (180) not blocked by Condition (h.b), various schemata and rules would derive from (180) the structure underlying (181.a), which, when analyzed as in (181.b), would generate (178.b) with the derived structure (179):

(181) (a) \*John bought, and Bill bought, houses.



Since this derivation is blocked, (178.b) can be generated only with the presumably-correct derived structure (182):



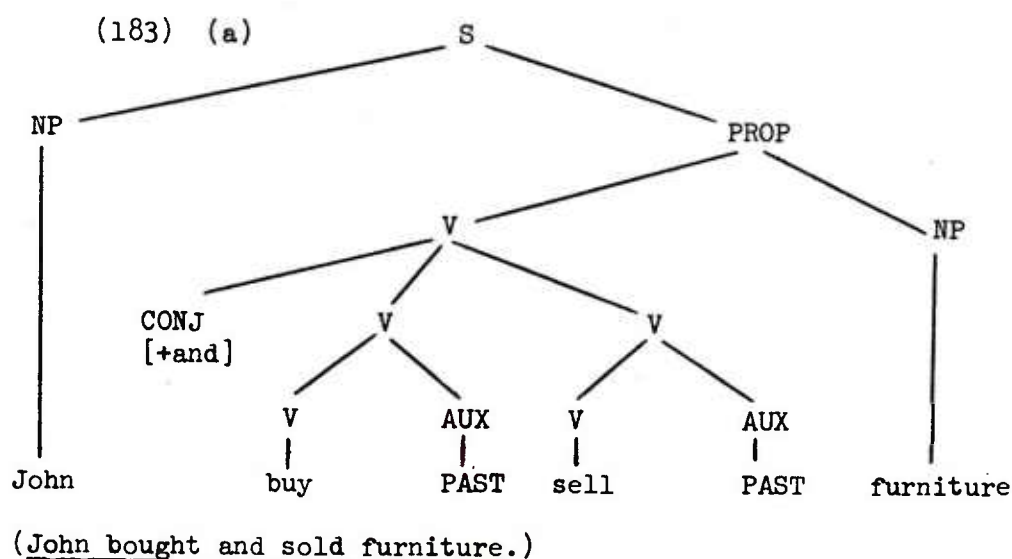


Condition (i): Neither B nor C consists of constituents of the following types:

- (a) inflectional affixes
- (b) certain derivational affixes
- (c) certain differing non-affixal AUX's
- (d) NP's marked for certain case differences
- (e) certain NP's differing only in DET's
- (f) certain differing DET's

There are certain types of constituents that are inherently non-conjoinable. (It was the non-conjoinability of some of these constituent types that was responsible for Schane's extension of the notion of "secondary conjunction" to cover all conjunctions of constituents belonging to non-major categories--cf. GEN INTRO, Section C.) Condition (i) is intended to preclude the application of the Derived Conjunction schema to sets of such constituents. (The list of non-conjoinable constituent types mentioned in Condition (i) is very likely suggestive rather than exhaustive.) The non-conjoinable constituent types mentioned in Condition (i) are discussed in turn below.

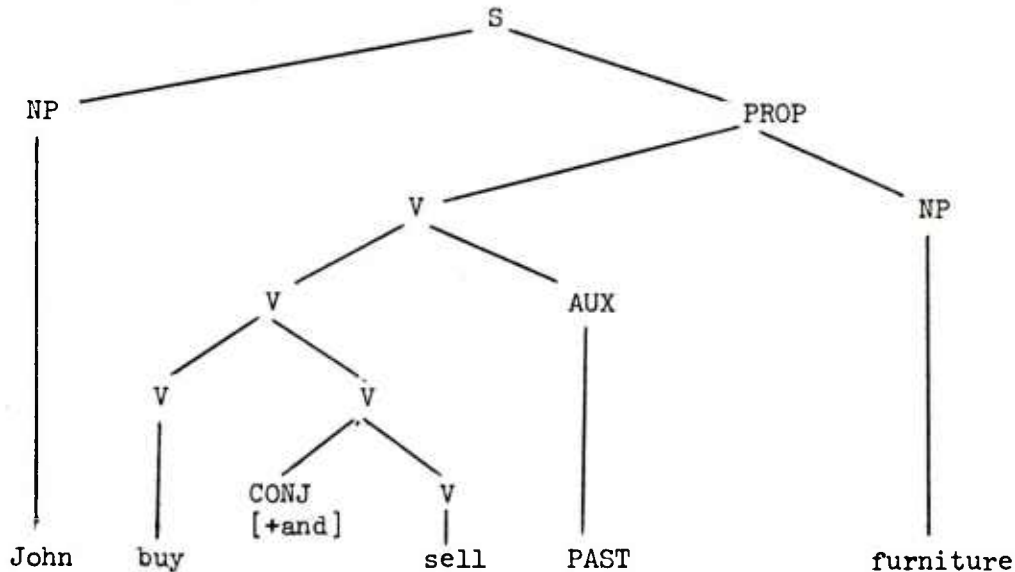
(a) The smallest units upon which derived conjunction can operate are, in general, not morphemes but words. Thus one would wish to avoid an application of the schema such as would follow from an analysis like (183.b), in which the conjoined V's of (72.i) are analyzed into the B's and C's of the schema in such a way that the C set consists of tense affixes:



(b) \*John    buy    PAST    sell    PAST    furniture  
                   B        C        B        C

Were such an application permitted, the schema would operate to initiate various schemata and rules that would ultimately replace (183.a) by (184.a), which would be realized as the ungrammatical (184.b):

(184) (a)



(b) \*John buy and sold furniture.

Such derivations are avoided by means of Condition (i), since the class of non-conjoinable constituent types is defined as including all inflectional affixes.

(There are several ways in which a special listing of inflectional affixes as non-conjoinable might be avoided. Of these, a promising one has to do with the possibility that, at the point in the rules at which the Derived Conjunction schema applies, the inflectional affixes are represented as features on the stems to which they ultimately attach. That is, it may be that the so-called "Affix Attachment" rule is really two separate rules, the first of which adds to stems features corresponding to the inflectional affixes, and the second of which "segmentalizes" these features as, normally, suffixes attached to the stems. Further, it may be the case that the first of these rules precedes application of the Derived Conjunction schema, but that the second follows it. If this is so, then a tree such as (183.a), in which the PAST affixes are already segmentalized, would never be a candidate for application of the schema.)

(b) Unlike inflectional affixes, some derivational affixes are at least sometimes conjoinable, as is evidenced by the examples of (185):

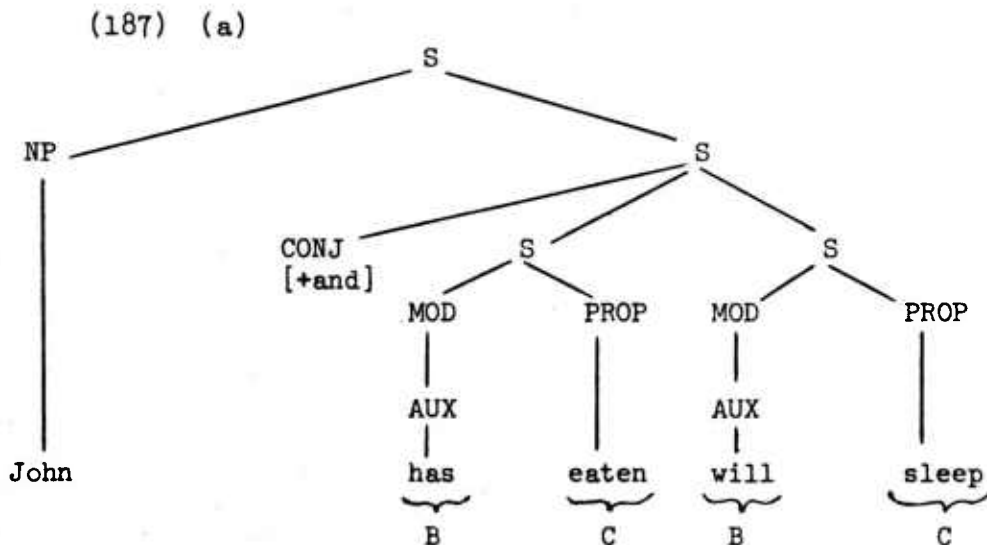
- (185). (a) pro- and anti-Castro forces  
 (b) sub- and supraliminal cues  
 (c) Anglo- and Franco-American relations

Such cases, if they do represent examples of affix conjunction (and it may be that pro-, anti-, etc. are full words with certain distributional restrictions), are certainly unusual, as is evidenced by examples such as:

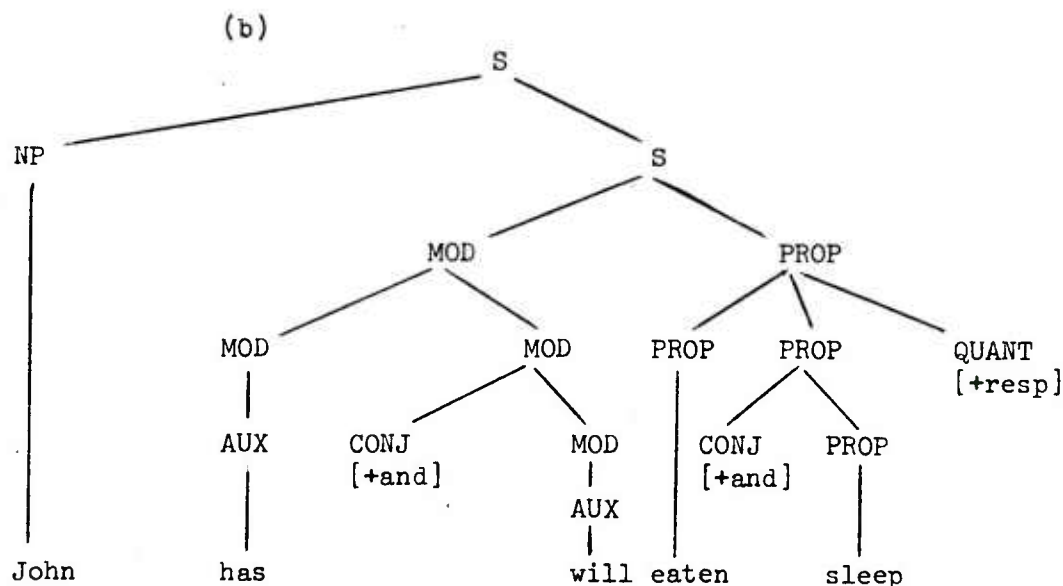
- (186) (a) \*sub- and admission (cf. submission and admission)  
 (b) \*de- and offensive (cf. defensive and offensive)  
 (c) \*tolerability and -ance (cf. tolerability and tolerance)  
 (d) \*mannish and -ly (cf. mannish and manly)

The conjunction of most derivational affixes (including, apparently, all derivational suffixes) is prevented by Condition (i). If some or all of the examples of (185) do involve affix conjunction, they represent exceptions.

(c) Unless specifically blocked, the schema would operate upon a tree such as (187.a) to derive ultimately, (187.b), which would be realized as the ungrammatical string (187.c):



(John has eaten and will sleep.)



(c) \*John has and will eaten and sleep respectively

Condition (i) blocks such undesirable derivations, since AUX's whose last IC's are not of the same type are included in the definition of non-conjoinable constituent types. Thus conjunctions where the last IC's of the AUX are both (or all) Modals, Perfects, Progressives, or Passives are acceptable, as in:

- (188) (a) He must eat and sleep.  
 (b) He may and must eat and sleep respectively.  
 (c) He has eaten and slept.  
 (d) He has and had eaten.  
 (e) He was eating and drinking.  
 (f) He was and is eating.  
 (g) He may have and must have eaten.  
 (h) He had been and still was eating.  
 (i) It could have been and should have been eaten.

But conjunctions on which the last IC's of the AUX's are a Perfect and a Modal (as in (187.c)), a Modal and a Progressive (as in (189.a)), a Perfect and a Passive (as in (189.b)), etc. are ungrammatical:

- (189) (a) \*He must and is eat and sleeping respectively.  
 (b) \*The missionary had and was eaten.

There are some apparent exceptions to the contention that the last IC's of the AUX's must both (or all) be of the same type: e.g.,

- (190) (a) He may and must have eaten.  
(b) It could have and should have been eaten.

Such cases, however, represent two successive applications of the schema, each of them conforming to Condition (i). Thus (190.a) results from re-application of the schema, etc., to the structure underlying (188.g), analyzed as follows:

- (191) he    may    have    must    have    eaten  
                  B        C        B        C

Since in (191) may and must are both Modals, and the two occurrences of have are both Perfects, application of the schema is permitted. Similarly, (190.b) results from reapplication of the schema, etc., to the structure underlying (188.i), analyzed as follows:

- (192) it    could have    been    should have    been    eaten  
                                  B                    C                    B                    C

(The schema could, in fact, be reapplied to the structure underlying (190.b), as in (193.a), to derive (193.b):

- (193) (a) it    could    have    should    have    been eaten  
                                  B        C        B        C

- (b) It could and should have been eaten.)

It is not altogether clear whether the Progressive be and the Passive be should be considered different AUX types for the purposes under discussion. The decision depends upon the status of such strings as the following, which, though certainly odd, are perhaps not ungrammatical:

- (194) ?The missionary was eating and eaten at the same time.

(d) Fillmore (1967) and others have noted that conjunctions like the following are at least unusual, and possibly ungrammatical:

- (195) (a) ??This key and that janitor can open the door.  
 (b) ??He sprayed the wall and the paint.

In a case grammar, the conjoined NP's of these sentences are marked for different underlying cases. Thus this key and that janitor in (195.a) are, respectively, Instrumental and Agentive, while the wall and the paint in (195.b) are, respectively, Locative and Neutral (or possibly Instrumental). It is possible, Fillmore has argued, that it is these case differences that account for the peculiarity of such examples.

It cannot, however, be asserted that no conjunctions of NP's in different cases are permitted, as is evidenced by such examples as:

- (196) (a) John and Mary respectively received and distributed the money.  
 (b) The Giants and the Dodgers respectively beat the Phillies and were beaten by them.

In (196.a), presumably John is Dative and Mary Agentive, yet the conjunction is permissible. Similarly (196.b) involves a permissible conjunction of an Agentive (the Giants) and Neutral (the Dodgers).

It might be possible to say that application of the Derived Conjunction schema to NP's is permitted when the NP's show certain case differences but not when they show other case differences. Thus it might be that conjunction of an Agentive and a Neutral, as in (196.b), is always permitted while the conjunction of a Locative and a Neutral, as in (195.b), is never permitted. Such a condition, however, would still have to allow the schema to operate where identical NP's were marked for case differences which would exclude the operation of the schema were the NP's non-identical. Consider, for example:

- (197) (a) He sprayed the wall and (then) he tore down the wall.  
 (b) He sprayed and (then) tore down the wall.  
 (c) He sprayed the wall and (then) he tore down the bridge.  
 (d) ?He sprayed and (then) tore down the wall and the bridge respectively.

Presumably, in (197.a) the first occurrence of the wall is Locative and the second Neutral. Yet, as the grammaticalness of (197.b) attests, the conjunction schema can operate with an analysis in which the two occurrences of the wall in (197.a) are treated as a conjoinable set. If, as seems true, (197.d) is appreciably



worse than (197.b) (i.e., if (197.d) is comparable to (196.b), then possibly Condition (h.d) could be rewritten so as to distinguish between identical and non-identical NP's.

It is also possible, however, that at least some of the odd strings that result from the conjunction of NP's marked for different cases are fully grammatical, but are anomalous because they violate the rule of surface-structure interpretation of the following general form, "If constituents are conjoined, they necessarily have a semantic relation." Thus the peculiarity of (196.a) may result from the fact that it is hard to find a semantic common denominator between this key and that janitor. If this is so, then the conjunction of these NP's should be anomalous even when they are marked for the same case. It is not clear to us whether or not this is the case: cf.

(198) ?I was looking for this key and that janitor.

In any event, such an explanation would not seem applicable to all of the examples cited. Thus, although (195.b) is questionable, it is not hard to find a semantic common denominator between the wall and the paint, and (199) seems perfectly acceptable:

(199) He stared at the wall and the paint.

It might appear that the most questionable examples involving the conjunction of NP's marked for different underlying cases, such as (196.a-b), involve underlying sentences in which the same head item (a verb in the examples) selects the different cases involved. However, (200), in which two different head items are involved, seems at least as unacceptable as (196.a).

(200) ??This key and that janitor can open and  
close the door respectively.

The above observations have led us to include Condition (i.d) in our present account of derived conjunction, although it is obvious that this inclusion must be regarded as tentative.

(e) This subpart of Condition (i) is intended to exclude such ungrammatical strings as:

- (201) (a) \*A man and (then) the man did it.
- (b) \*The men and (then) some men did it.

However, we must admit that excluding such strings in this way does not account for the oddity of the presumed sources of these sentences: i.e., the structures underlying, respectively:

- (202) (a) ?A man did it and (then) the man did it.  
(b) ?The men did it and (then) some men did it.

With regard to examples such as (201) and (202), Gleitman's (1965) observations regarding conjunction and stress (a subject not gone into in detail in the present account of conjunction) seem highly relevant. Gleitman convincingly argues that the rules relating to conjoined structures must provide for the introduction of stresses on certain "non-repeated" (i.e., either formally non-identical or formally identical but referentially distinct) constituents. Thus the constituents stressed in the following examples of sentence conjunction:

- (203) (a) I saw an old house and I saw a new house.  
(b) Washington (D.C.) is in the East and Washington (State) is in the West.

would not necessarily be stressed were the sub-sentences in which they occur not conjoined: cf.

- (204) (a) I saw an old house.  
(b) Washington (D.C.) is in the East.

Gleitman points out, further, that in cases where the only non-repeated constituents in conjoined structures are determiners, while examples like (201) and (202) are ungrammatical (or questionable), similar examples involving stressable determiners are quite satisfactory: e.g.,

- (205) (a) One man and (then) the other man did it.  
(b) Those men and (then) some other men did it.  
(c) One man did it and (then) the other man did it.  
(d) Those men did it and (then) some other men did it.

On the basis of such evidence, she proposes rules similar to the following (where \* is an indicator of stress, inserted by rule on certain non-repeated constituents in conjoined structures):

- (206) (a) a\* → one, another  
(b) some\* → some, some other  
(c) the (sg.)\* → this, that, the other  
(d) the (pl.)\* → these, those, the others

In other words, one, and another are stressed forms of a, etc.

Were our schema extended so as to include provisions for stress placement, then, it is probable that Condition (i.e) could be eliminated.

(f) This subpart of Condition (i) is intended to exclude such ungrammatical strings as:

- (207) (a) \*The and a man and woman respectively arrived.
- (b) \*That and one man and woman respectively arrived.
- (c) \*We bought some beans and carrot.
- (d) \*We bought the beans and carrot.

Were we to consider only examples like (207.a), it might seem that Gleitman's proposals about stress in relation to conjunction might automatically handle the problem. However, it is clear from (207.b), which contains stressed counterparts of the determiners of (207.a) and is nonetheless ungrammatical, that such is not the case.

Strings like (207.c) and (207.d) are meant to show that determiners differing only in number cannot be conjoined (and ultimately collapsed by a subsequent rule into a single plural form). Thus we must avoid deriving these strings from the structures underlying, respectively:

- (208) (a) We bought some beans and a carrot.
- (b) We bought the beans and the carrot.

(The ungrammaticalness of (207.d), if it is a fact, indicates that "singular" the and "plural" the must be distinguished just as a and some must.)

Condition (i.f) on the schema is meant to block these and similar derivations. Ultimately, however, it must be so framed that, while blocking the examples of (207), it permits such probably grammatical conjunctions of determiners as occur in:

- (209) (a) This and several other arguments were presented.
- (b) These and many other men have managed it.

Condition (j): If  $\{B\}$  does not consist of single IC's of  $\{A\}$ , then  $\{B\}$  does not end with constituents of the following types:

- (a) certain derivational affixes
- (b) certain differing non-affixal AUX's
- (c) certain DET's

This condition is to "secondary conjunction" what Condition (i) is to "primary conjunction", and, like Condition (i), it is no doubt less than exhaustive. What Condition (i) does is to block the application of the Derived Conjunction schema in certain cases where, were the schema to be applied, the  $\{B\}$  set would consist of the first IC of the  $\{A\}$  set plus a remainder that ended in inherently non-conjoinable constituents. Examples of ungrammatical strings whose derivation is blocked by Condition (j) are:

- (210) (a) \*I went on the de-, and John went on the of-, fensive.
- (b) \*John has, and Bill will, eaten and sleep respectively.
- (c) \*The liner sailed down the, and the tugboat chugged up the, river.

(These examples pertain to subparts (a), (b), and (c) of the condition respectively.)

As in the case of Condition (i), there are, again, certain derivational affixes, certain differing non-affixal AUX's, and certain DET's to which the condition does not apply: e.g.,

- (211) (a) ?I supported the pro-, and he supported the anti-, Castro forces.
- (b) John should, and Bill must, eat and sleep respectively.
- (c) The liner sailed down this, and the tugboat chugged up that, river.

(In the case of derivational affixes, a similar restriction, not stated in the present grammar, must be imposed upon the C set to block such derivations as (212.b) from (212.a):

- (212) (a) Mary is too mannish for Bill, and Susan is too childish for Bill.
- (b) \*Mary is too man-, and Susan is too child-, ish for Bill.)

### 3. Derived But- and Or-Conjunction

Conjoined structures involving but and or have been accorded much less attention by transformationally-oriented grammarians than have conjoined structures involving and. The fullest investigation of but-conjunction to date, Bellert (1966), is concerned primarily with the semantics of the conjunction, and limits itself entirely to uses of but as a connector of full S's. As for or-conjunction, it has received even less in the way of systematic scrutiny, although notes on some of its properties do appear in the work of Schane and others.

The present study will do little to correct this situation. Although we shall propose a schema for derived but- and or-conjunction (in fact, the same schema proposed for and-conjunction), our account of derived but- and or-conjunction will not be highly detailed, and will remain somewhat isolated from our general account of derived conjunction, which centers around constructions involving and.

Before discussing derived constructions involving but and or, we shall offer a few observations on these conjunctions as connectors of full S's. In the first place, then, as Gleitman (1965) has observed, but, unlike and and or, cannot occur more than once in a set of conjoined S's--or, to put it another way, exactly two S's may be conjoined by but. Thus, while (213.a) and (213.b) are grammatical, (213.c) is not:

- (213) (a) John will sing and Bill will dance and  
Peter will play the piano.
- (b) John will sing or Bill will dance or  
Peter will play the piano.
- (c) \*John will sing but Bill will dance but  
Peter will play the piano.

It is true, of course, that more than one but may occur in a sentence: e.g.,

- (214) Mary is beautiful but (she is) dumb, but Helen  
is perfect.

But in the deep structure corresponding to such a sentence, each but conjoins exactly two S's. Thus the deep structure corresponding to (214) is, roughly:





equivalent sentence or an implied sentence in which they are met. A case in which there is an equivalent sentence would be (218), which is obviously a paraphrase of (217.c):

(218) John is happy but Mary is sad.

A case in which there is an implied sentence would be (219), which implies (217.b):

(219) John went to Boston but Mary stayed home.

In some cases where simple instances of but conjunction are "implied", neither of the conjoined S's of the simple instances may actually be uttered. Thus in:

(220) John practiced the piano but Mary watched TV.

while the "implied" simple instance of but-conjunction might be one of the following:

(221) (a) John practiced the piano but Mary didn't.  
(b) John didn't watch TV but Mary did.

it might also, according to what the speaker has in mind, be one of the following:

(222) (a) John obeyed Mother but Mary didn't.  
(b) John is a chip off the old block but Mary isn't.  
(c) John is complusive but Mary isn't.  
etc., etc.

Obviously, then, Bellert's conditions (a) and (b) cannot be captured in a purely syntactic account of but-conjunction (nor, in fact, could they really be captured in any purely linguistic account).

Even greater difficulties would arise in attempting to formalize Harris's (1965) observation to the effect that but-conjunction normally requires at least two differences in the conjoined S's (to which, e.g.,

(223) (a) She is beautiful but she is dumb.  
(b) She respects him but she fears him.  
(c) She plays rarely but she plays beautifully.

constitute apparent exceptions.) While it might be possible to give some account in the semantic component of the oddity of:

- (224) (a) She is beautiful but her sister is beautiful.  
 (b) She plays the piano but she plays the violin.

no such account is attempted in the present grammar, and the only restriction imposed on but-conjunction of S's (that is not also imposed on and-conjunction) is the condition on binariness expressed in (216), above.

With regard to or-conjunction of full S's, T. Diller has observed that there is, in addition to the alternative (ALT) use of or, an "ultimatum" (ULT) use of this conjunction. Consider the sentences:

- (225) (a) (Either) John will play or I will (play).  
 (b) John had better play or I will (play).

While (225.a) is a simple prediction that one of two events will occur, (225.b) is a kind of threat to the effect that, unless one event occurs, another (undesirable) event will.

There are several syntactic differences between the ALT or and the ULT or. First, only the ALT or allows either to occur before the first of the conjoined S's (when exactly two S's are involved): compare (225.a) and:

- (226) \*Either John had better play or I will.

Second, the ULT or always precedes a declarative sub-sentence, while the ALT or may precede a declarative, interrogative or imperative sub-sentence. On the other hand, while the ALT or is always preceded and followed by sentences in the same mood, the ULT or, although followed by a declarative, may be preceded by an imperative. Consider:

- (227) (a) (Put your) hands up or I'll shoot. (ULT)  
 (b) Will John play or will Bill (play)? (ALT)  
 (c) Say something sensible or be quiet. (ALT)

Finally, only the ALT or permits derived conjunction, as in:

- (228) (Either) John or I will play.

In this connection, note that, while (229.a) may be interpreted as involving either the ALT or or the ULT or, (229.b) allows of the former interpretation only:

- (229) (a) There will be a settlement or there will be trouble.
- (b) There will be (either) a settlement or trouble.

Since the ULT or does not permit derived conjunction, it is not given any further attention here.

To turn now to derived but- and or-conjunction, we may begin by noting an important difference between, on the one hand, but- and or-conjunction and, on the other, and-conjunction, with respect to the range of conjoined sentences that are potential candidates for derived conjunction. As we have seen, in the case of and-conjunction there is no requirement of identity between parts of the conjoined sentences in order for the Derived Conjunction schema to apply. Thus the schema can apply to (230.a) just as it can to (230.b):

- (230) (a) Mary is beautiful and John is strong.
- (b) Mary is beautiful and Mary is strong.

with the ultimate results being (among others), respectively:

- (231) (a) Mary and John are beautiful and strong respectively.
- (b) Mary is both beautiful and strong.

In the case of but- and or-conjunction, on the other hand, there is a requirement of identity between parts of the conjoined sentences in order for derived conjunction to be possible. Thus, while both (232.a) and (232.b) are grammatical instances of but-conjunction of full S's, only (232.b) can undergo derived conjunction, the ultimate result being (232.c):

- (232) (a) Mary is beautiful but John is strong.
- (b) Mary is beautiful but Mary is strong.
- (c) Mary is beautiful but strong.

Similarly, of the or-conjoined full S's of (233.a) and (233.b), only those of (233.b) are subject to derived conjunction, the ultimate result being (233.c):

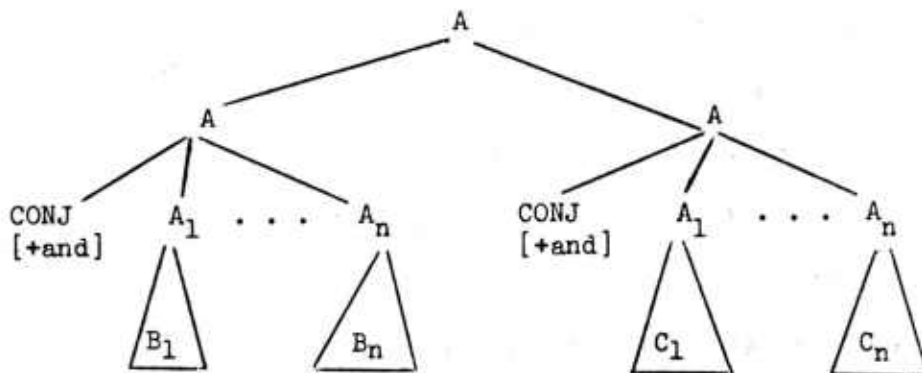
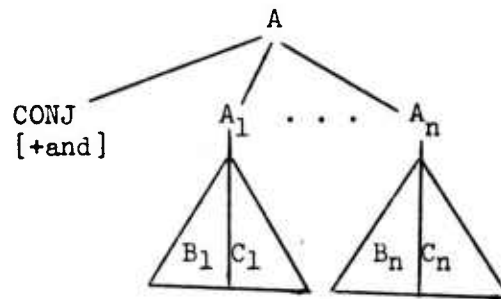
- (233) (a) Mary is beautiful or John is strong.
- (b) Mary is beautiful or Mary is strong.
- (c) Mary is beautiful or strong.

Another way of stating the difference under discussion is the following: respectively does not occur in conjoined structures derived from underlying but- or or-conjoined S's, and there is no process in derived but- or or-conjunction similar to the process of respectively insertion in derived and-conjunction.

In spite of this difference, it nonetheless seems desirable to postulate an essentially uniform process for all derived conjunction, whether the underlying conjunction is and, but, or or. This may, in fact, be done quite easily by placing an appropriate condition on the Derived Conjunction schema, to preclude the application of the schema in certain instances in which the underlying conjunction is but or or. Before we state this condition, however, it may be helpful to repeat the Derived-And-Conjunction schema at this point, and to show how the schema may be modified so as to apply when the underlying conjunction is but or or.

The And-Conjunction schema, then, has the form:

(234)



Now in order to generalize this schema, we need only replace the [+and] under CONJ by [+X], where X is a variable ranging over and, but, and or, and where all X's in any one application of the schema have the same value. Then, in order to ensure that the proper identity conditions for derived but- or or- conjunction are met, we need only add a condition to the following effect:

- (235) Condition: where [+X]  $\neq$  [+and], either all members of the set  $\{B_1...B_n\}$  are totally identical or all members of the set  $\{C_1...C_n\}$  are totally identical.

Such a condition automatically precludes the application of the schema to the structures underlying such sentences as (232.a) or (233.a). In the case of (232.b) or (233.b), on the other hand, the condition is met, so the schema may apply. (Since, by means of the condition stated in (235) the members of one of the sets of conjuncts involved in derived but- or or-conjunction will always be totally identical, the Identical-Conjunct Collapsing schema will always be applicable in such cases, with the result that the CONJ associated by the schema with this set will always be deleted--cf. Section III.C, below.)

Some special account is needed of sentences such as (236.a-b) which, presumably, are derived from the structures underlying (236.c-d) respectively:

- (236) (a) He saw not John but Bill.  
 (b) He saw John but not Bill.  
 (c) He did not see John but he saw Bill.  
 (d) He saw John but he did not see Bill.

It is clear that, e.g., (236.a) cannot be derived from (236.c) if the structure underlying the latter is analyzed into the B's and C's of the Derived Conjunction schema in such a way as to conform with the condition stated in (235). The structure underlying (236.c) can be analyzed into the B's and C's of the schema, in conformity with the condition, as follows:

- (237) he   did not see John   he   saw Bill  
           B                                   C                                   B                                   C

This analysis would result, ultimately, in:

- (238) He did not see John but saw Bill.

If, however, we attempt to analyze the structure underlying did not see John/saw Bill in (238) into the B's and C's of the schema, we get:

(239) PAST NEG see John saw Bill  
           └───┬───┘ └──┬──┘ └──┬──┘ └──┬──┘  
               B      C      B      C

But the analysis (239) does not conform with the condition stated in (235), and hence (236.a) should not be directly derivable from this analysis.

Perhaps what is required is a special rule of NEG-attraction in but-conjunction that converts a structure such as that underlying the string of (239) into a structure that is analyzable into the B's and C's of the Derived Conjunction schema in such a way as to conform with the condition of (235): i.e.,

(240) saw NEG John saw Bill  
       └──┬──┘ └──┬──┘ └──┬──┘ └──┬──┘  
           B      C      B      C

Such a rule could also account for the derivation of (236.b) from the structure underlying (236.d) in some such way as follows:

- (241) (a) he saw John but he PAST NEG see Bill  
           ⇒ (by Derived Conjunction)  
       (b) he saw John but PAST NEG see Bill  
           ⇒ (by NEG-Attraction)  
       (c) he saw John but saw NEG Bill  
           ⇒ (by Derived Conjunction)  
       (d) he saw John but NEG Bill  
           (He saw John but not Bill.)

Since we have not attempted to formulate such a NEG-attraction rule in the present grammar, however, the derivation of sentences like (236.a-b) remains unaccounted for.



Of the various conditions proposed in Section III.A.a, above, on application of the Derived Conjunction schema when the underlying conjunction is and, we have not investigated which also apply when it is but or or. It seems likely that all of them do apply, and that possibly other special conditions, in addition to (235), must be included so as to properly restrict derived structures with but or or. It may be noted, in any case, that but and or, like and, occur in a very wide range of structures involving derived conjunction, including structures that involve "secondary conjunction". Some pertinent examples are:

- (242) (a) I considered the sausage but chose the spaghetti.  
 (b) He hinted at, but refused to admit, his part in the plot.  
 (c) Hazel has small but conspicuous spots on her dress.  
 (d) He studies intelligently but sporadically.  
 (e) Bill likes, but Wallace dislikes, long hair.  
 (f) Mother gave Ruth a dime but Marie a quarter.
- (243) (a) She'll watch television or go to the movies.  
 (b) She'll broil or fry the steak.  
 (c) John or Bill will help you.  
 (d) He'll come today or tomorrow.  
 (e) (Either) Bill likes, or Wallace dislikes, long hair.  
 (f) Mother gave Ruth a dime or Marie a quarter.

#### B. The Node Relabeling Schema (obligatory)

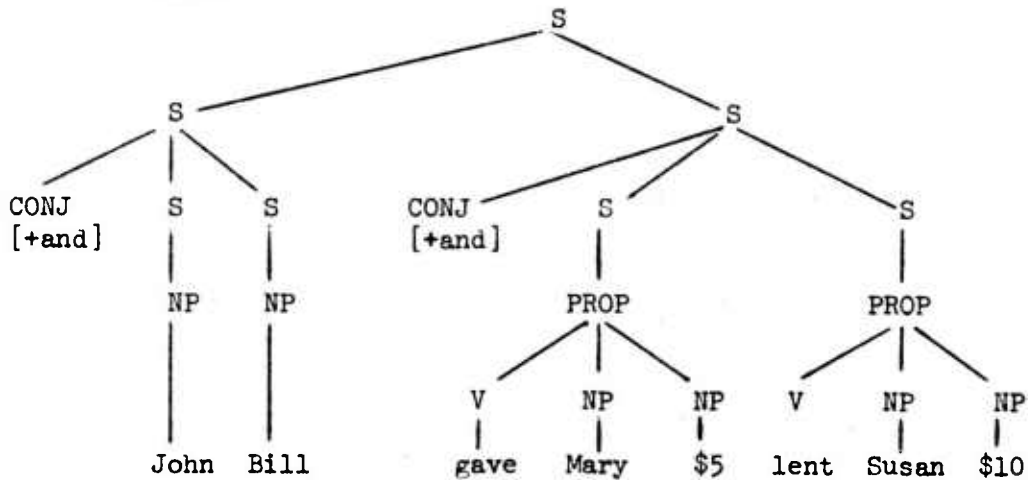
The Node Relabeling schema has the following form:



Where the nodes  $Z_1 \dots Z_n$  are the only daughters of  $A_1 \dots A_n$  respectively

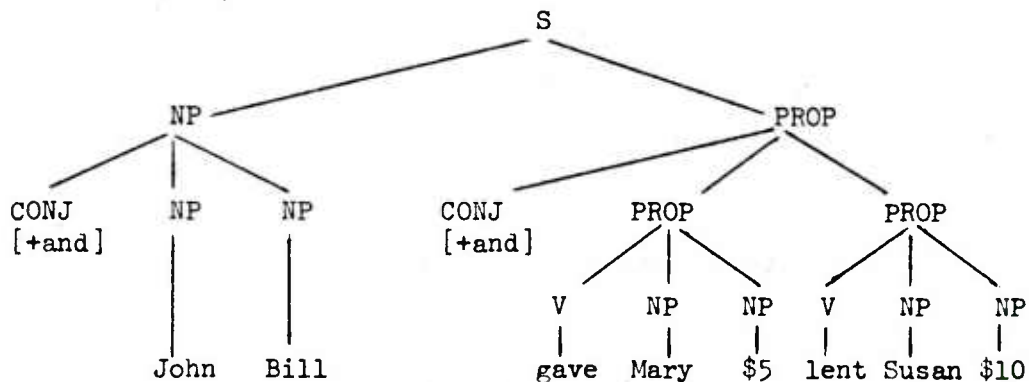
Its effect is to eliminate certain nodes introduced by the Derived Conjunction schema. Where application of the Derived Conjunction schema results in primary conjunction, Node Relabeling always applies both to the set of conjuncts  $\{B_1...B_n\}$  and to the set  $\{C_1...C_n\}$ . For example, where application of the Derived Conjunction schema results in the tree:

(245)

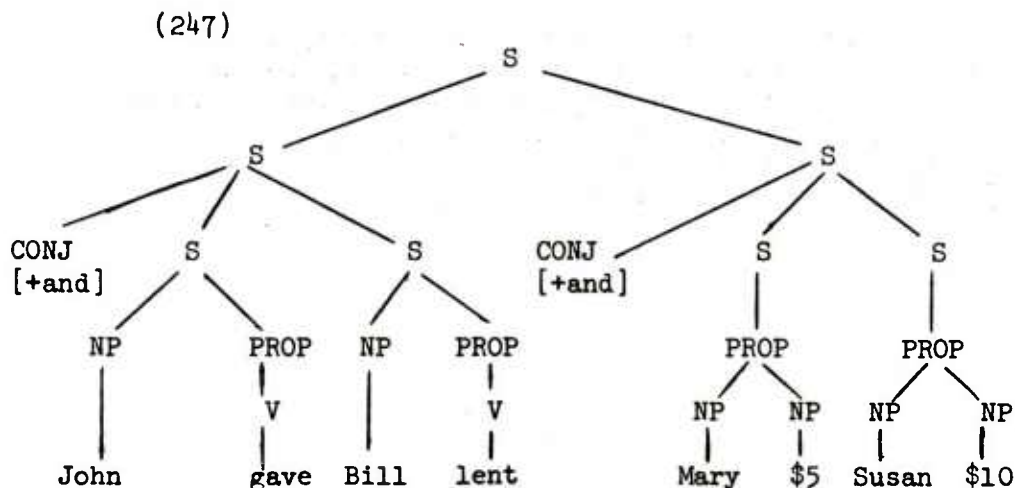


the Node Relabeling schema relabels both the S nodes over the conjoined NP's and those over the conjoined PROP's. Thus after application of the Node Relabeling schema to (245), the tree has the form:

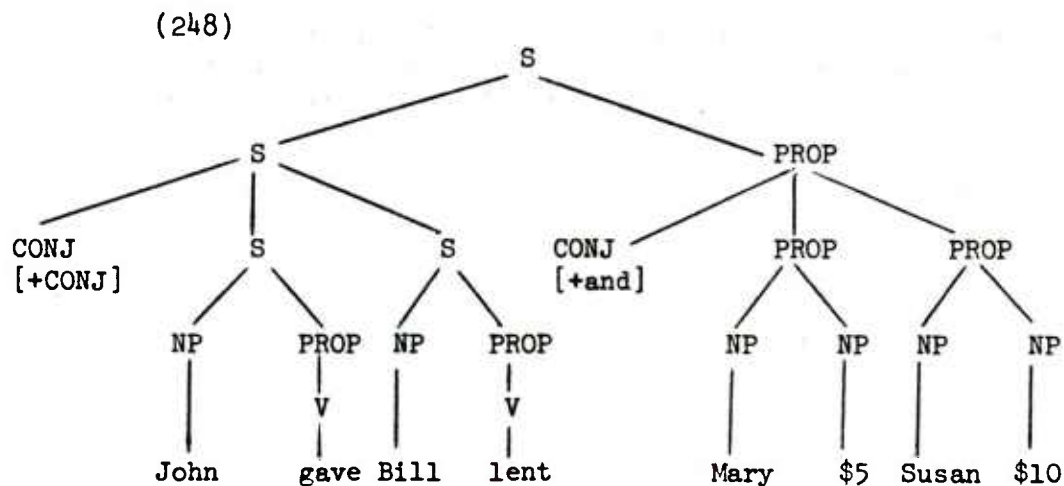
(246)



When, on the other hand, application of the Derived Conjunction schema results in secondary conjunction, Node Relabeling fails to apply to that set of conjuncts whose members are not single constituents. For example, where application of the Derived Conjunction schema results in the tree:

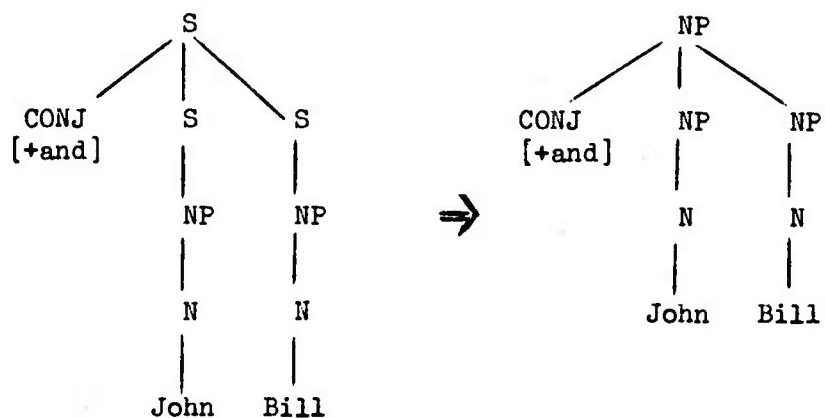


the Node Relabeling schema relabels the S nodes over the right-hand set of conjuncts (each of which is a PROP), but fails to apply to the left-hand set of conjuncts (each of which is a NP PROP, and hence not a single constituent). Thus after the application of the Node Relabeling schema to (247), the tree has the form:



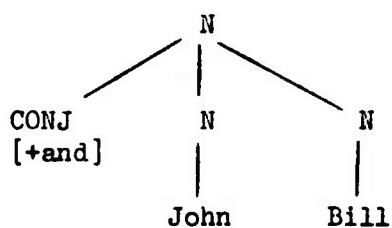
Node Relabeling never reapplies to a structure that is the immediate result of Node Relabeling. For example, if Node Relabeling has applied to change the subtree (249.a) to the subtree (249.b):

(249)



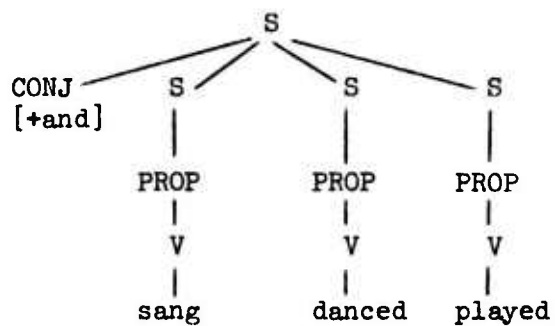
it cannot reapply to change (249.b) to (250):

(250)



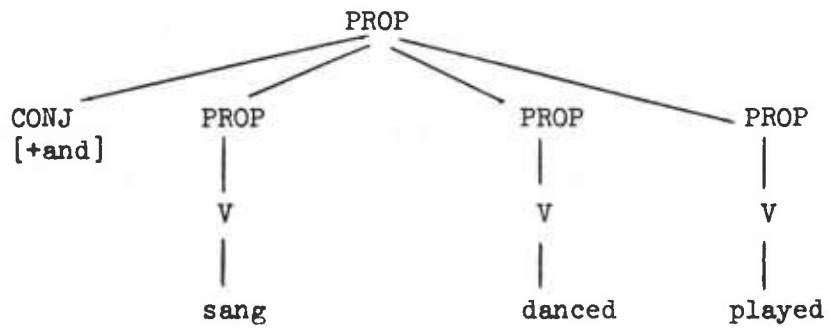
Similarly, operating upon a subtree such as:

(251)

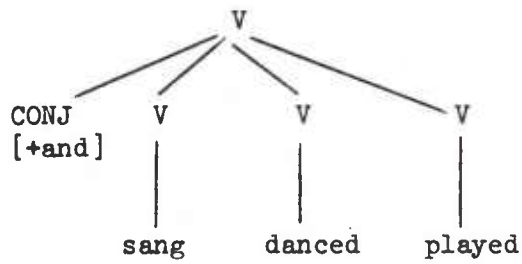


node relabeling results in (252.a) rather than (252.b)

(252) (a)

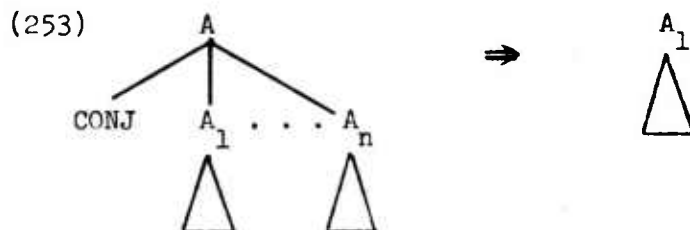


(b)



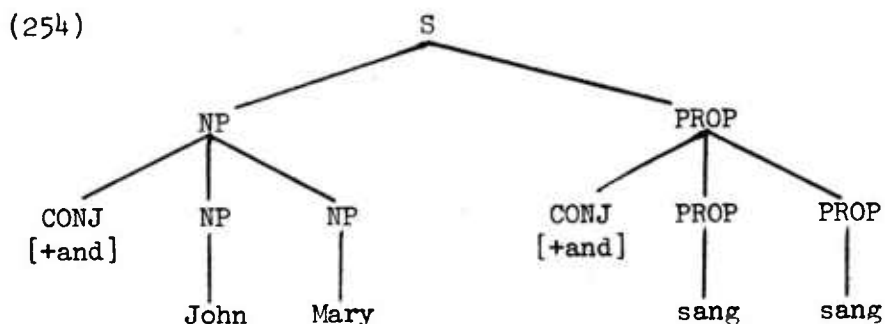
## C. Identical Conjunct Collapsing (partly optional)

The Identical-Conjunct Collapsing schema has the form:



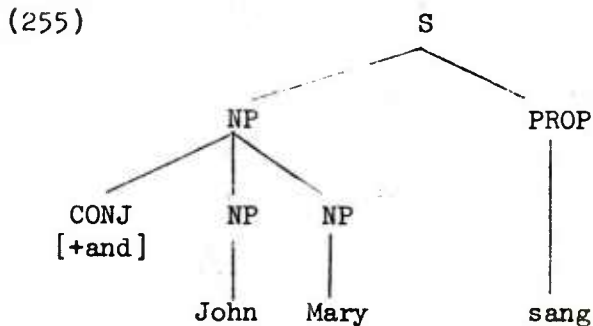
- Conditions: (1)  $A_1 \equiv A_2 \equiv \dots A_n$   
 (2) Optional if  $A_1$  includes an occurrence of NP; otherwise obligatory.

This schema operates in cases where application of the Derived Conjunction and Node Relabeling schemata has resulted in the derivation of a set of totally identical conjuncts. Its effect is to replace the set of identical conjuncts by a single number of the set, and to delete the conjunction. Thus it operates, for example, upon the right-hand set of conjuncts of:



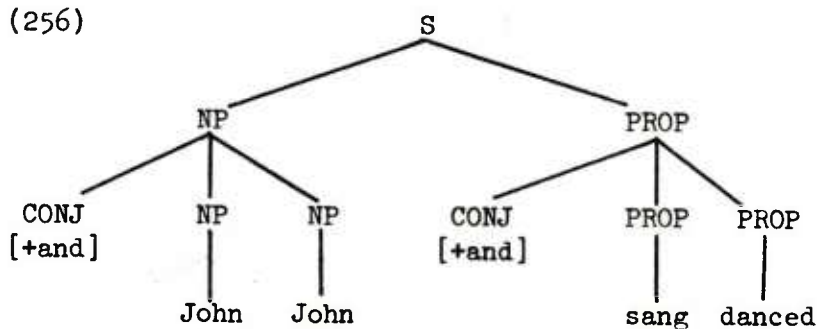
to derive:



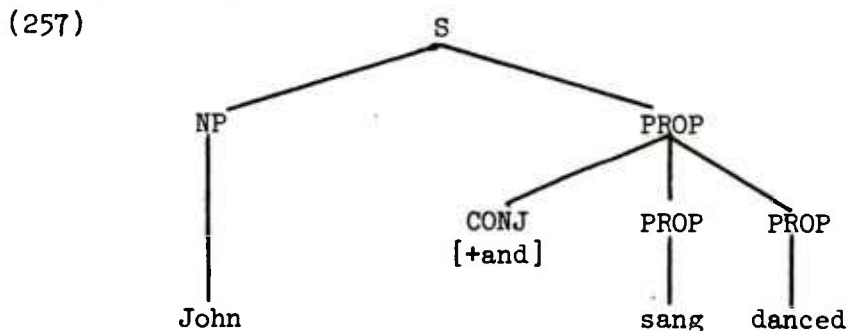


The second condition on the schema, to the effect that application is optional if the totally identical conjuncts include NP's reflects our decision not to include referential indexing in the syntax, and thus to make all rules that depend upon referential identity optional (as discussed in PRO). Formally identical structures that include NP's may behave under conjunction either like other identical structures or like non-identical structures (according to whether or not the NP's are referentially, as well as formally, identical).

Thus given a tree such as:



the Identical Conjunct Collapsing schema may or may not be applied. If it is applied, the result is:



(Ultimately: John (both) sang and danced.)

If it is not applied, the ultimate result is (258.a) or (258.b)

- (258) (a) John and John respectively sang and danced.
- (b) John and John sang and danced respectively.

As presently stated, the condition on the schema making application optional if the totally identical conjuncts include NP's is too strong. That is, there are some formally identical NP's which must, because of their meanings, be referentially identical as well, and in such cases application of the schema is obligatory. Among the NP's of which this is true are I and NP's with generic determiners. Thus from the structure underlying:

- (259) I sang and I danced.

may be derived (260.a) but not (260.b)

- (260) (a) I (both) sang and danced.
- (b) \*I and I sang and danced respectively.

Similarly from the structure underlying (261.a) may be derived (261.b) but not (261.c)

- (261) (a) John likes dogs and Bill likes dogs.
- (b) John and Bill (both/each) like dogs.
- (c) \*John and Bill like dogs (and dogs) respectively.

(In (261.c), and dogs appears in parentheses, since, if the structure underlying dogs and dogs were to be generated, the Plural Collapsing schema--cf. Section G, below--would obligatorily apply to it, reducing it to dogs. Since (261.c) is ungrammatical with or without and dogs, this point is rather academic.)

Ultimately, then, when more is known about just which formally-identical NP's are necessarily referentially identical as well, the second condition on the Identical-Conjunct Collapsing schema must be revised so as to make application of the schema obligatory in the appropriate cases.

#### D. Set Marking (obligatory)

It has usually been assumed that conjoined NP's must be specified as "plural" (i.e., assigned the feature [+Plural]) in

order to account for, e.g., the "plural" number agreement and "plural" anaphoric pronominalization found in such sentences as:

- (262) (a) Peter, Paul, and Mary sing very well,  
don't they?  
(b) His son and daughter have left, and they  
aren't coming back.

There are, however, several arguments that can be offered against such an assumption. In the first place, if [+Plural] is the feature responsible for the occurrence of the plural affix (usually the suffix -(e)s) in nouns, it is clear that this affix is not present in the conjoined NP's of sentences such as (262). Thus, in (262.b) his son and daughter is not changed to his son(s) and daughters, even though the sentence does involve "plural" number agreement and anaphora. Furthermore, there are conjoined NP's (of a type that we do not deal with in detail in this analysis) that do involve plural affixes but that do not require "plural" number agreement or anaphora: e.g.,

- (263) Bacon and eggs is a popular breakfast, isn't it?

Moreover, if we look elsewhere in the language, at the collective nouns, we find that the occurrence of a plural affix is, in the case of such nouns, by no means required in order for "plural" number agreement and anaphora to be possible. Thus in many dialects the even-numbered sentences of (264) are fully as grammatical as the odd-numbered sentences:

- (264) (a) The group sings very well, doesn't it?  
(b) The group sing very well, don't they?  
(c) His family has left, and it isn't coming  
back.  
(d) His family have left, and they aren't  
coming back.

Such evidence points to a conclusion that there is no necessary relation between the occurrence of a [+Plural] feature specification within a Noun Phrase and the occurrence of "plural" number agreement and anaphora. The latter phenomena, we would maintain, have nothing at all to do, at least directly, with the [+Plural] specification of Nouns, but depend, instead, upon a feature of entire Noun Phrases. This feature, which we adopt from McCawley (1967a), we shall call [+Set].

It is suggested the [+Set] feature be optionally assigned to NP's headed by a singular noun with the feature [+Collective], as well as being obligatorily assigned to and-conjoined NP's (other than the bacon-and-eggs and a-gentleman-and-a-scholar types, which are not discussed here) and to NP's headed by a plural noun. Our formulation of the Set Marking rule here, however, is limited to and-conjoined NP's.

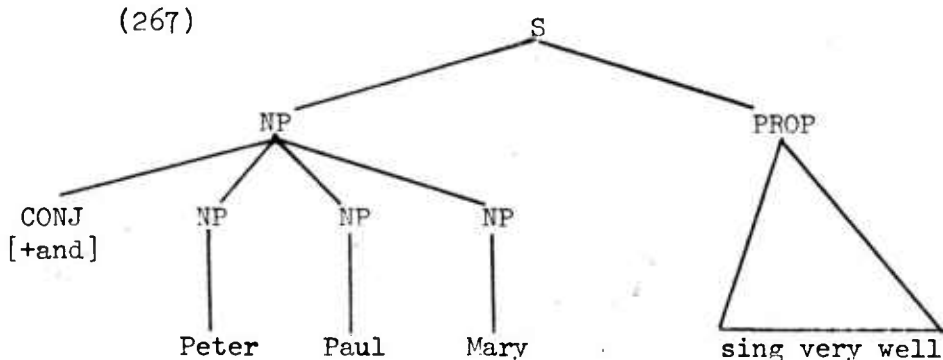
(265) SD: X      X  
                  NP      [-CONJ X] X  
                               { [+and] }  
                               1      2      3

SC: Add [+Set] as feature of 2

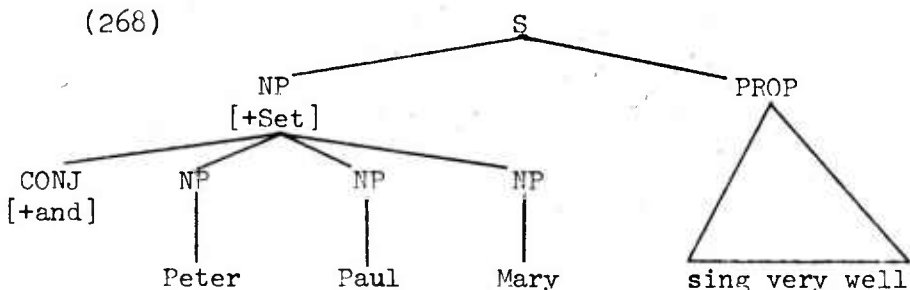
(Set marking of or-conjoined NP's, not dealt with here, requires a different rule, in which, for most dialects, the [+Set] feature is added to the NP dominating the or-conjoined set if any one of the conjuncts is headed by a plural noun: e.g.,

- (266) (a) Either John or the children don't like fish.  
 (b) Either the children or John don't like fish.  
 (c) Either John or Bill doesn't like fish.)

The rule operates upon, e.g.:



to derive:

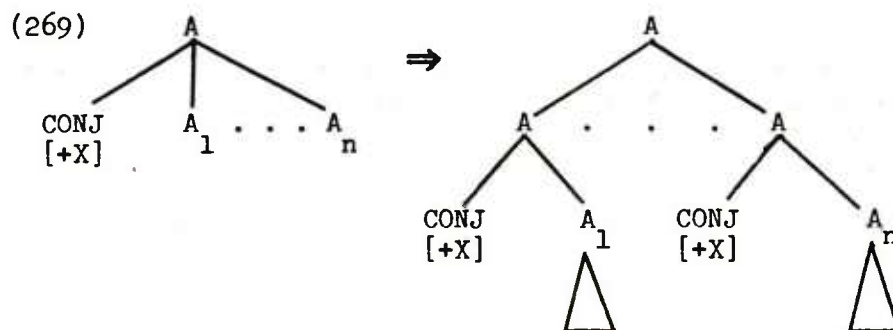


(Ultimately: Peter, Paul, and Mary sing very well.)

It should be noted that this formulation of the Set Marking rule presupposes that those rules that depend upon the presence or absence of the [+Set] feature on an NP--i.e., number agreement and pronominalization--follow derived conjunction, and are, in fact, last-cyclic. (For a discussion of the ordering of number agreement in relation to other rules, cf. RULE ORDERING.)

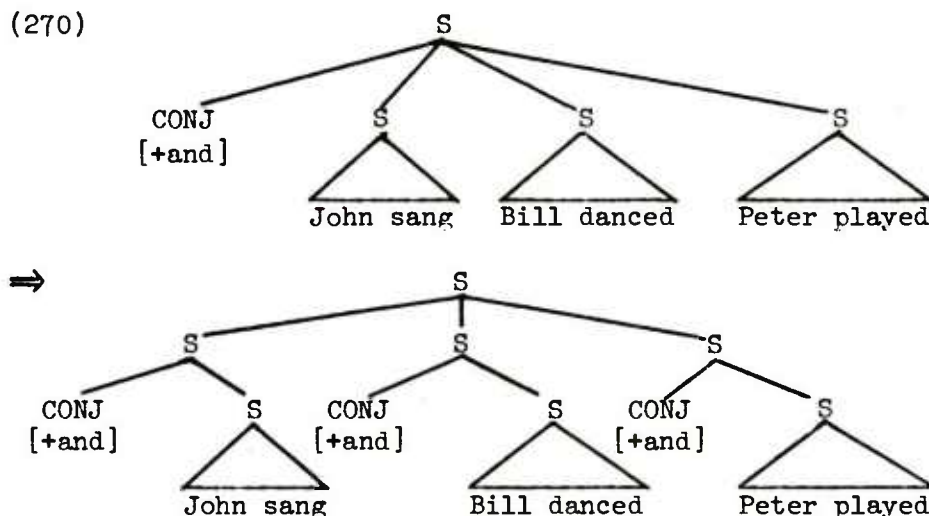
#### E. Conjunction Spreading (obligatory)

The Conjunction-Spreading schema has essentially the form proposed in Lakoff and Peters (1966):



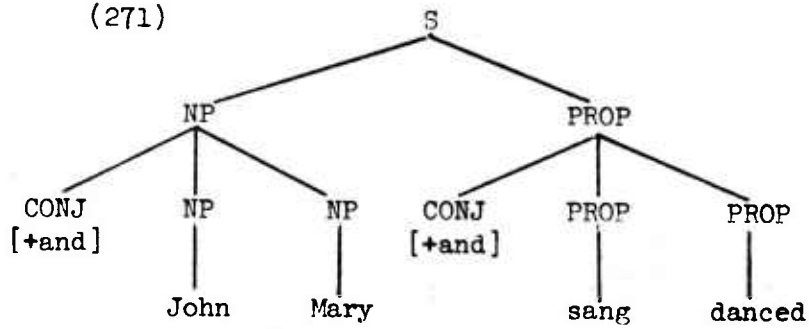
Where [+X] = [+and], [+but], or [+or].

Some examples of the application of the schema are:

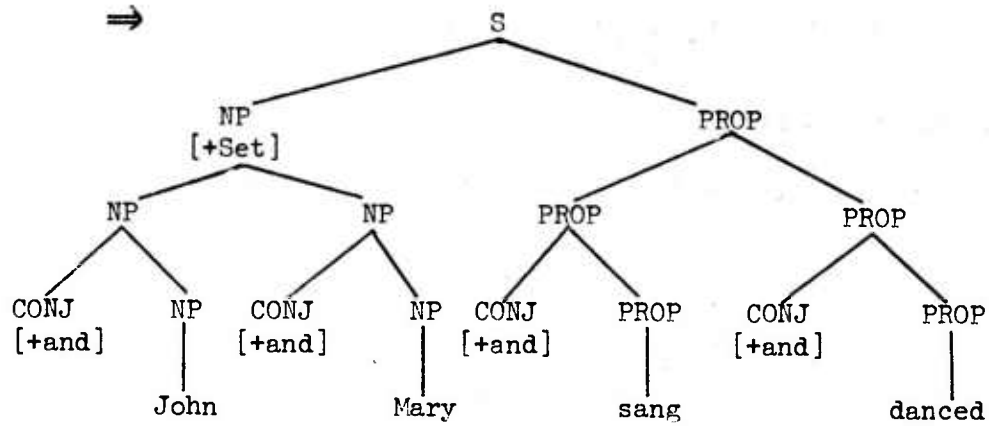


(Ultimately: John sang and Bill danced and Peter played.)

(271)

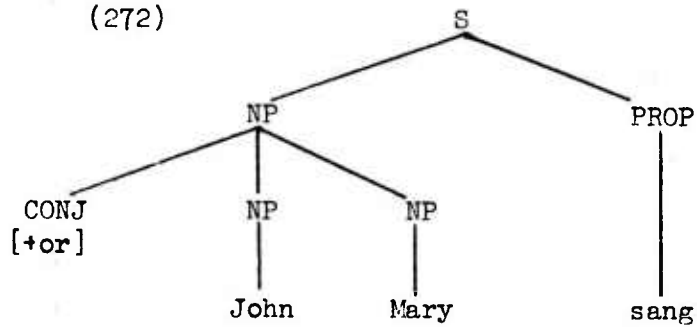


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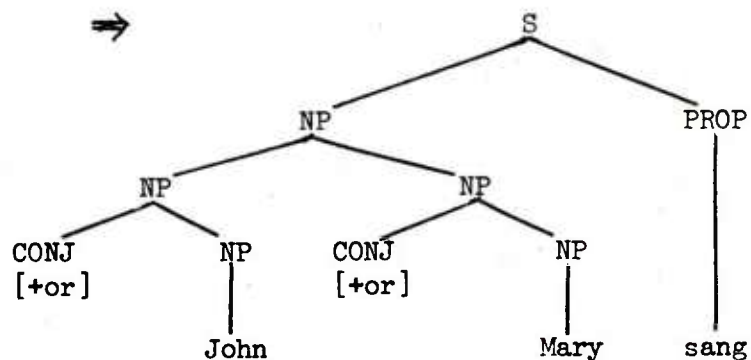


(Ultimately: John and Mary sang and danced respectively.)

(272)





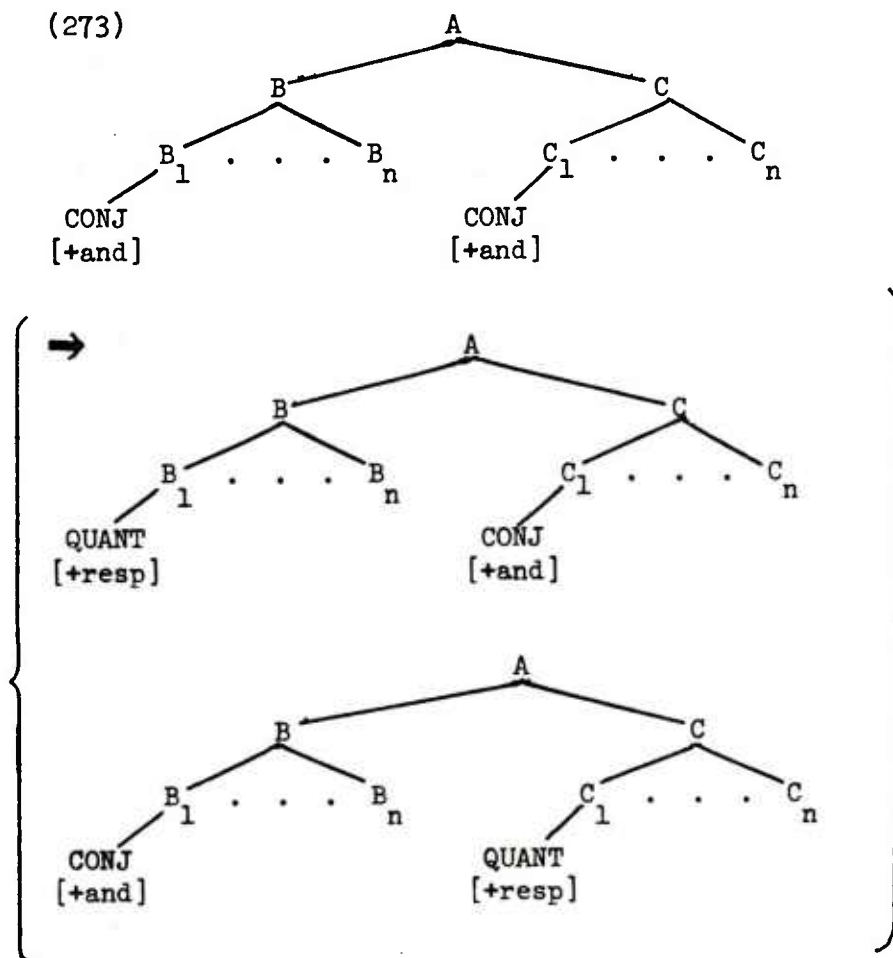


(Ultimately: (Either) John or Mary sang.)

F. Respectively Insertion (obligatory)

The Respectively Insertion schema has the following form:

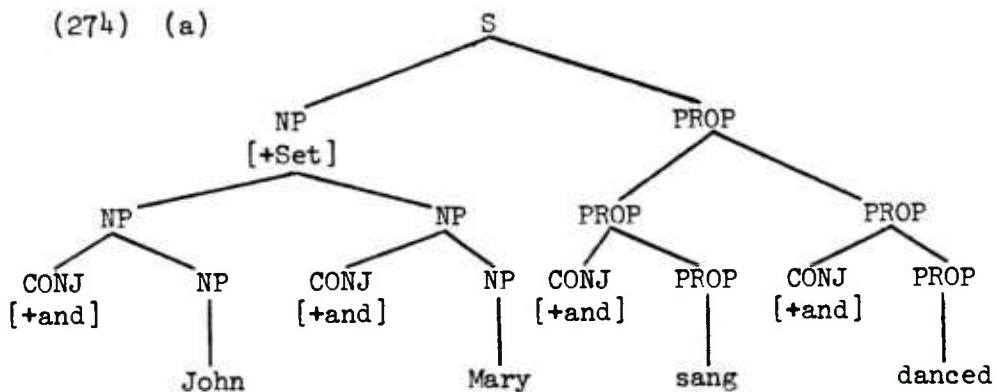
(273)



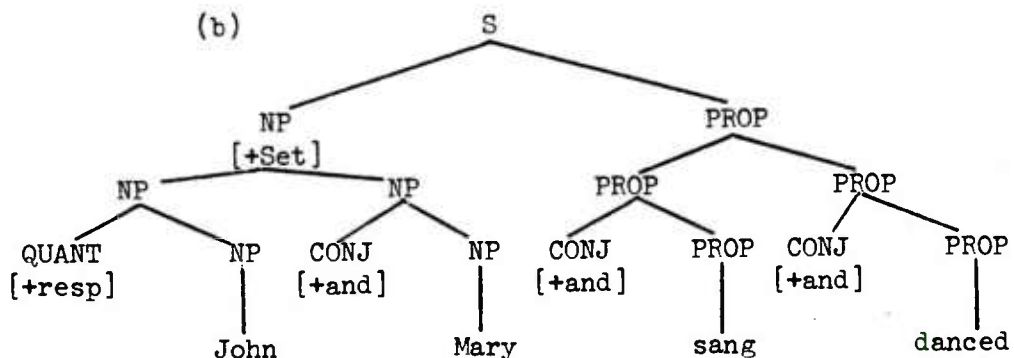
It operates upon derived and-conjoined structures in which neither of the sets of conjuncts has undergone Identical-Conjunct Collapsing (cf. III.C, above). (If either set of conjuncts has undergone Identical-Conjunct Collapsing, the structure will fail to conform with that of the left-hand tree of (273) and Respectively Insertion will be inapplicable.) The schema operates to replace the initial and of either the first or the second set of conjuncts by respectively (which, at this point in the derivation, is represented by a complex of features [+QUANT(ifier),+resp(ectively)]). Later, the Quantifier Movement rule (cf. Section III.M) obligatorily moves respectively to the end of the set of conjuncts into which it has been inserted, or, in some cases, into certain other sentence positions.

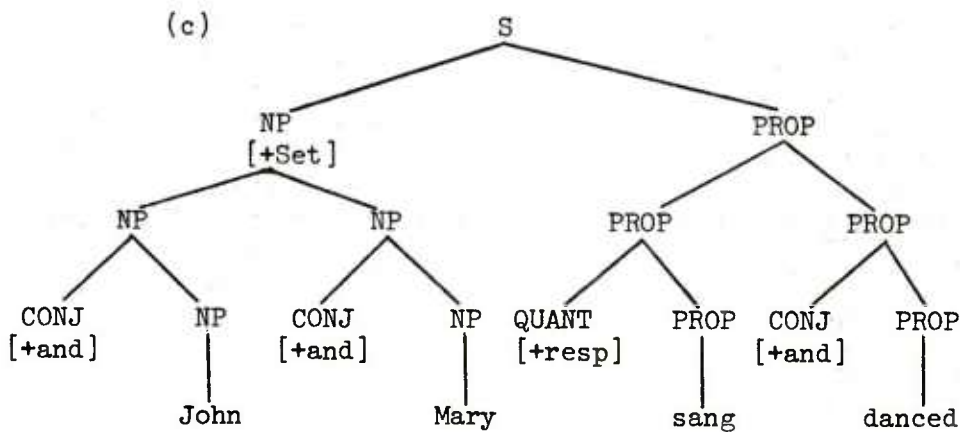
The Respectively-Insertion schema operates, for example, upon (274.a) to derive either (274.b) or (274.c):

(274) (a)



(b)





Ultimately, (274.b) and (274.c) result in (275.a) and (275.b) respectively:

- (275) (a) John and Mary respectively sang and danced.  
 (b) John and Mary sang and danced respectively.

As McCawley (1967b) has pointed out, more than one respectively may occur in a sentence, though the number of respectively's must always be at least one less than the number of and-conjoined sets. Thus we find sentences such as (276.a) but not sentences such as (276.b):

- (276) (a) John and Bill went to New York and Chicago respectively on Monday and Wednesday respectively.  
 (b) \*John and Bill respectively went to New York and Chicago respectively on Monday and Wednesday respectively.

In our view, the occurrence of more than one respectively in a sentence merely indicates that the Derived Conjunction schema, etc. have been applied more than once in such a way as to result in structures that meet the conditions for the Respectively Insertion schema. For example, the derivation of (276.a) is something like the following:

- (277) John went to New York on Monday, and Bill went to Chicago on Wednesday.

⇒ John went to New York, and Bill went to Chicago, on Monday and (on) Wednesday respectively.

⇒ John and Bill went to New York and (went to) Chicago respectively on Monday and (on) Wednesday respectively.

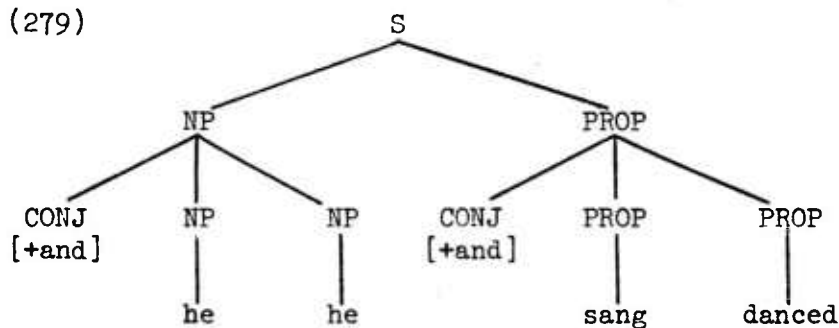
The limitation of the number of respectively's to at least one less than the number of and-conjoined sets is accounted for automatically by the fact that the Respectively Insertion schema never permits respectively to be inserted into both the first and the second of two sets of conjuncts that are ICs of the same structure.

#### G. Plural Collapsing (partly optional)

The Identical-Conjunct Collapsing schema (cf. III.C, above) operates to replace sets of totally identical conjuncts by a single member of the act. When the totally identical conjuncts are NP's, application of the schema is, with certain exceptions, optional. Exercise of the option is equivalent to treating the identical NP's as referentially identical, as well as formally identical. Failure to exercise the option is equivalent to treating the identical NP's as referentially distinct. Thus given a structure such as that underlying:

(278) He sang and he danced.

if the Derived Conjunction schema, etc. are applied to derive:



application of the Identical-Conjunct Collapsing schema results, ultimately, in:

(280) He (both) sang and danced.

in which case, clearly, the two occurrences of he in the underlying structure have been treated as referentially identical. On the other hand, if the Identical-Conjunct Collapsing schema is not applied to (279), one wishes the resultant sentence to be:

(281) They sang and danced respectively.

in which case the two occurrences of he in the underlying structure have been treated as referentially distinct.

Examples like the derivation of (281) from (279) involve the "collapsing" of a set of and-conjoined personal pronouns into a single plural pronoun. Such collapsing may occur not only when the conjoined pronouns are formally identical, but in other cases as well, e.g.,

- (282) (a) He and she sang and danced respectively.  
→ They sang and danced respectively.
- (b) He and they sang and danced respectively.  
→ They sang and danced respectively.
- (c) He and I sang and danced respectively.  
→ We sang and danced respectively.

The (partly optional) schema which replaces a set of and-conjoined personal pronouns by a single plural pronoun is presented in the PRO Section. In the present section, we shall present a similar schema that is needed for certain sets of and-conjoined NP's that are headed by count nouns.

Consider the sentences:

- (283) (a) Those men sang and danced respectively.
- (b) John and Bill (both) married beautiful women.

Sentence (283.a) may derive from the structure underlying any of the following:

- (284) (a) That man sang and that man danced.
- (b) Those men sang and those men danced.
- (c) That man sang and those men danced.
- (d) Those men sang and that man danced.

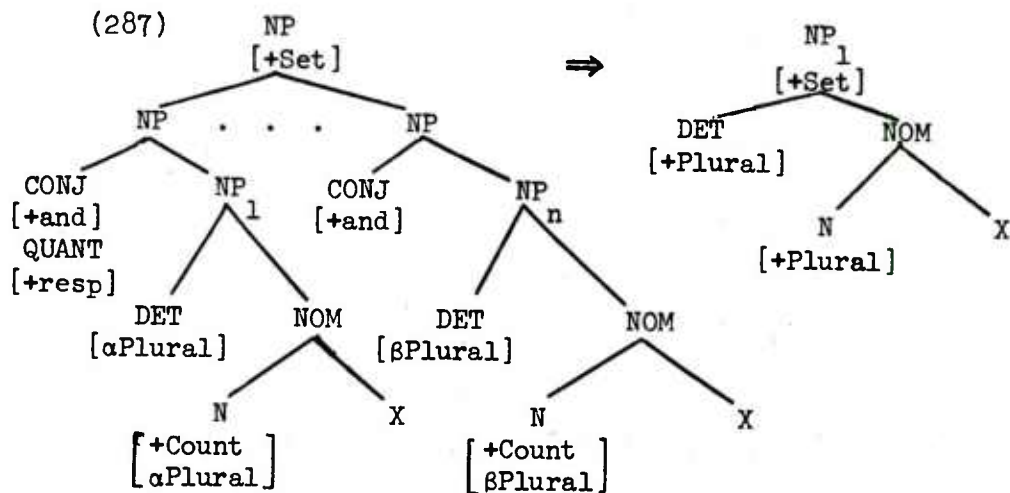
Similarly (283.b) may derive from the structure underlying any of the following:

- (285) (a) John married a beautiful woman and  
Bill married a beautiful woman.
- (b) John married beautiful women and  
Bill married beautiful women.
- (c) John married a beautiful woman and  
Bill married beautiful women.
- (d) John married beautiful women and  
Bill married a beautiful woman.

(In the case of (284.a-b) and (285.a-b), it would also have been possible to treat the formally identical NP's as referentially identical, and to apply the Identical-Conjunct Collapsing schema so as to derive, ultimately:

- (286) (a) That man (both) sang and danced. ( $\leftarrow$ (284.a))  
 (b) Those men (both) sang and danced. ( $\leftarrow$ (284.b))  
 (c) John and Bill (both) married a beautiful woman. ( $\leftarrow$ (285.a))  
 (d) John and Bill (both) married beautiful women. ( $\leftarrow$ (285.b))

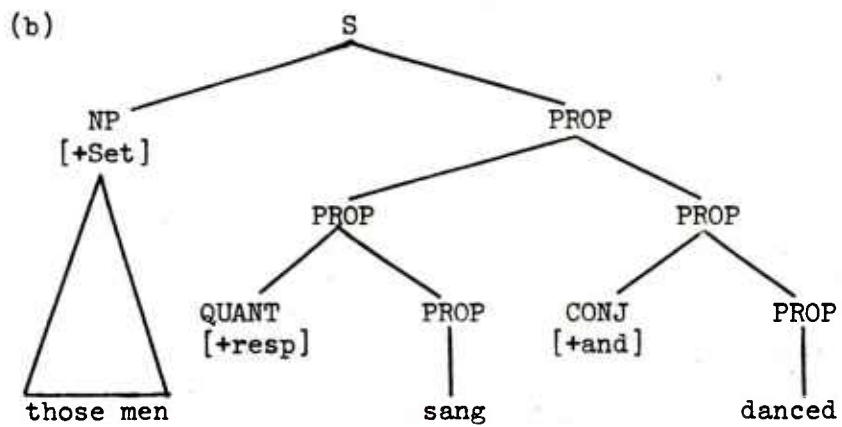
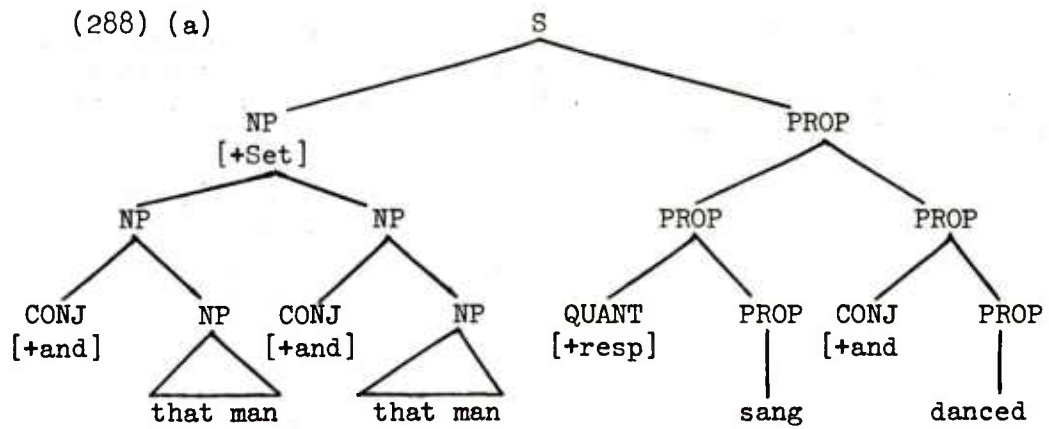
What is needed, then, is a schema that operates to replace a set of count-noun-headed NP's that are either totally identical, or identical except for the number specification of the nouns (and determiners, etc.), by a single NP headed by a plural noun. This schema may be stated as follows:



Condition:  $NP_1 \equiv NP_2 \equiv NP_n$ , except that the specifications for [Plural] may differ

The schema applies, for example, to change (288.a) to (288.b):

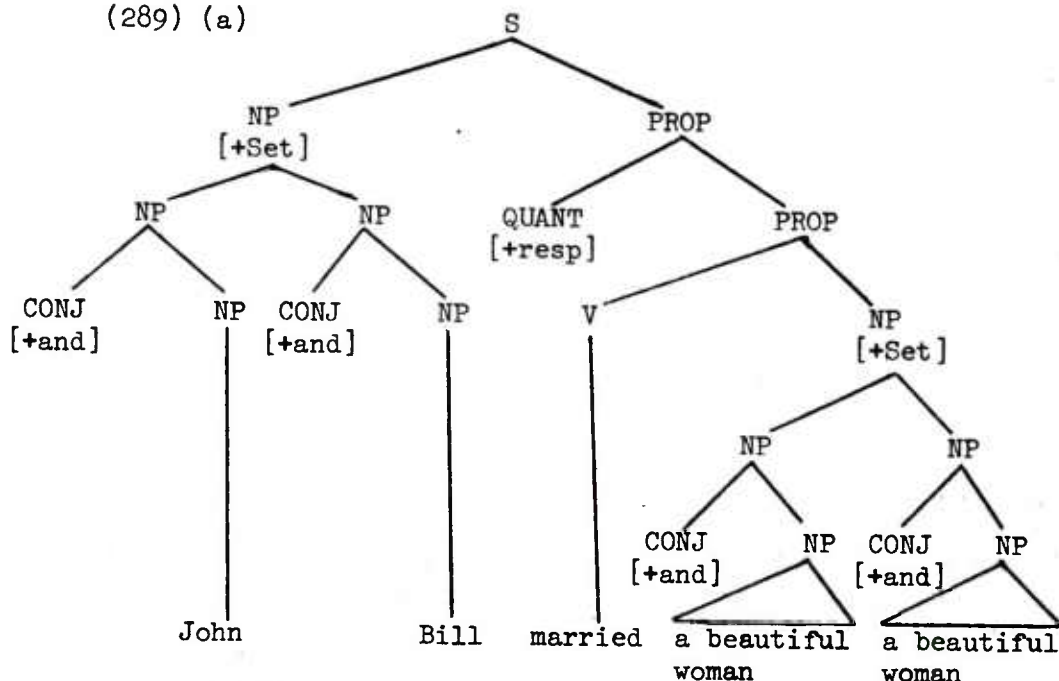




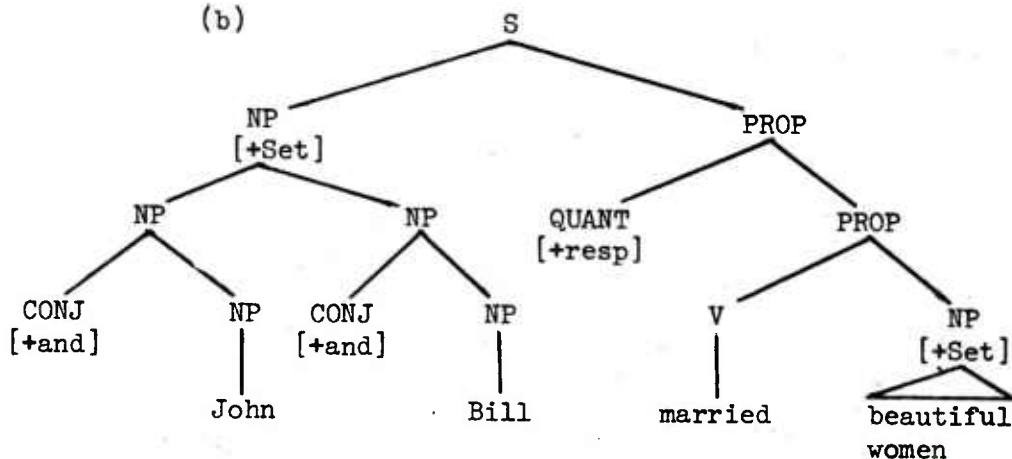
(Ultimately: Those men sang and danced respectively.)

Similarly, it applies to change (289.a) to (289.b):

(289) (a)



(b)



(Ultimately, after deletion of QUANT [+resp]--cf. Section III.H--below--etc.: John and Bill (both) married beautiful women.)

It is necessary that the Plural Collapsing schema follow the Respectively Insertion schema in order to account for the occurrence of respectively in sentences such as (283.a). On the other hand, it is necessary that the Identical-Conjunct Collapsing schema (cf. Section III.C, above) precede the Respectively Insertion schema in order to account for the non-occurrence of respectively in sentences such as (286.b) (Those men (both) sang and danced.).

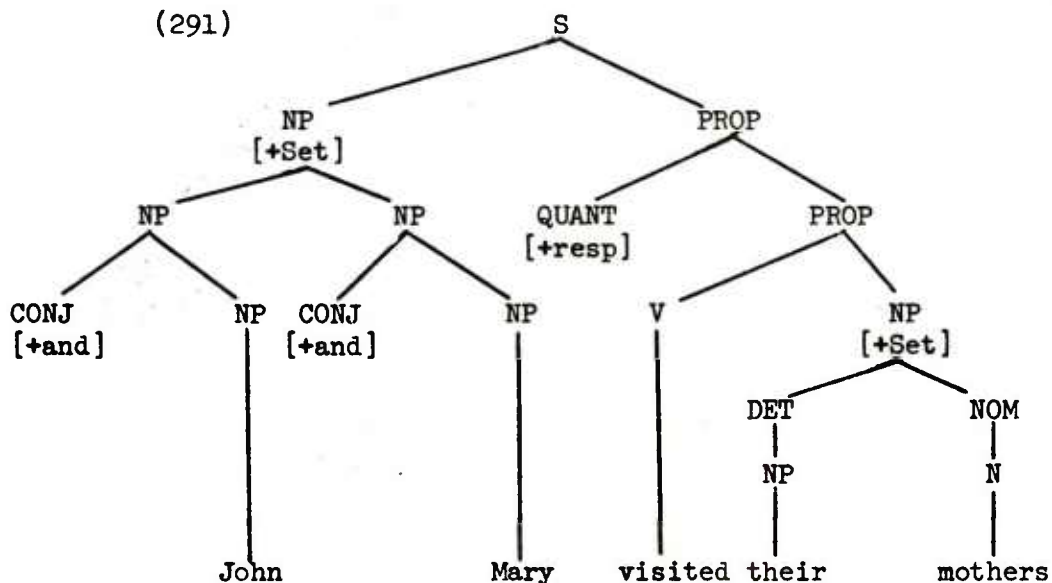
Since the application of the Identical-Conjunct Collapsing schema may result in the occurrence of a common-noun-headed plural NP corresponding to a set of underlying conjoined NP's, and since application of the Plural Collapsing schema always results in the occurrence of an NP of this type, the ordering of these two schemata in relation to the Respectively Insertion schema is crucial in accounting for just when respectively may occur and when it may not.

- H. Respectively → Respective (obligatory);  
Respectively Deletion (obligatory)

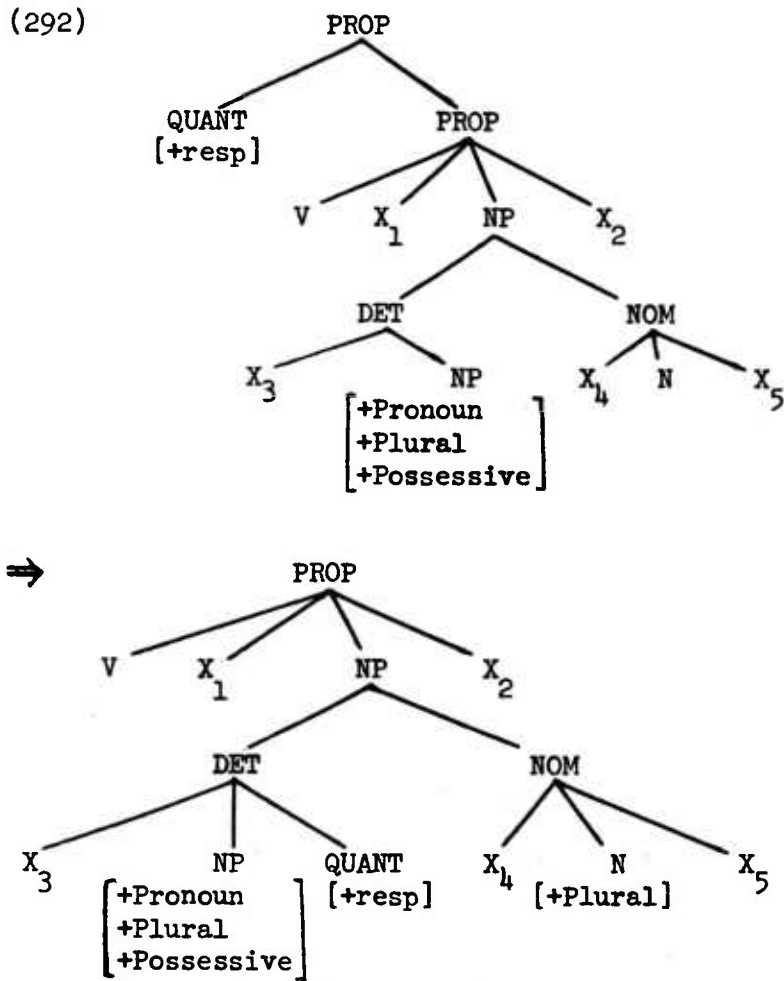
In some cases the Respectively Insertion schema, the Plural Collapsing schema, and the conjoined pronoun rule apply in such a way as to result in a tree in which QUANT [+resp] occurs as left sister to a PROP within which a plural head noun is modified by a plural possessive pronoun. For example, from the structure underlying:

- (290) John visited his mother and Mary visited her mother.

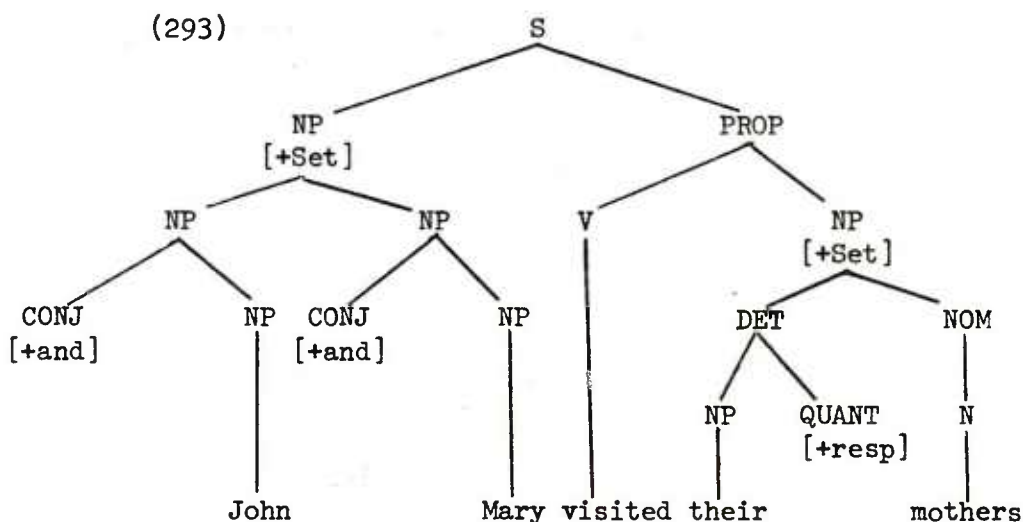
the following tree may be derived:



Trees like (291) are subject to a schema which moves QUANT [+resp] into the determiner of the NP after the possessive pronoun. This schema may be stated as follows:



Application of (292) to (291) results in (293):



In the Second Lexicon, QUANT [+resp] is listed as respective when it is dominated by DET(erminer). (It is listed as respectively in other cases.) Therefore (293) is ultimately realized as the sentence:

(294) John and Mary visited their respective mothers.

Other examples reflecting the operation of the Respectively → Respective schema (292) are:

- (295) (a) Have you and John visited your respective mothers?  
 (b) John and I visited our respective mothers on Monday and Tuesday respectively.

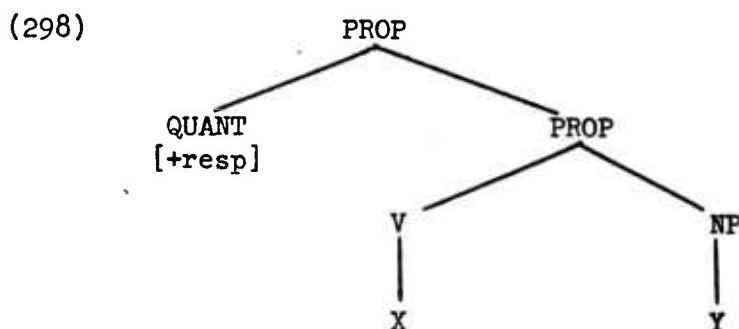
(The structures from which (295.a) and (295.b) are derived are those which, had the Derived Conjunction schema, etc. not been applied, would have resulted in the sentences (296.a) and (296.b) respectively:

- (296) (a) Have you visited your mother, and has John visited his mother?  
 (b) John visited his mother on Monday, and I visited my mother on Tuesday.)

In Section III.G, above, we noted, in connection with tree (289.b), that, as a result of the application of the Respectively Insertion and Plural Collapsing schemata, structures may be derived which involve an occurrence of QUANT [+resp] that must be deleted. If QUANT [+resp] were not deleted from tree (289.b), for example, the ultimate result would be the ungrammatical (297.a), rather than the grammatical (297.b).

- (297) (a) \*John and Bill respectively married beautiful women.  
 (b) John and Bill (both) married beautiful women.

It might seem at first that respectively should be deleted whenever the Respectively Insertion and Plural Collapsing schemata result in subtrees of the shape:



where neither X nor Y is a conjoined structure, and where the Respectively → Respective schema is inapplicable. Consider, however, exchanges such as:

- (299) (a) A: Who married Susan and Helen?  
           B: John and Bill respectively married them.  
 (b) A: Who bought the Rodin, the Matisse, and the Picasso?  
           B: Charles bought the sculpture, and John and Bill respectively bought the paintings.

If, as seems to be the case, (299.a.B) and (299.b.B) are grammatical, then the ungrammaticalness of (297.a) cannot be attributed to the obligatory deletion of QUANT [+resp] from all subtrees of the shape (298). Rather, it appears that the deletion of QUANT [+resp] from a subtree of the shape (298) is obligatory just in those cases in which the NP does not include a definite (and non-generic) determiner.



To put it another way, the occurrence of respectively with a structure that involves a "collapsed" plural NP always pre-supposes a context in which the referents of the several NP's underlying the plural NP have been distinguished and ordered. Thus a sentence such as:

(300) They live in New York and Chicago respectively.

can be used only in a context in which it is known to what two people (or groups of people) they refers, and in what order these two people (or groups) are being referred to. Thus a possible context for (300) is in answer to a question such as:

(301) Where do John and Bill live?

But if the use of respectively with a "collapsed" plural NP requires that the several referents of the NP be known, it is entirely consistent that we should find that the NP must have a [+Definite,-Generic] determiner, since the meaning of such a determiner is something very much like "referent known".

We may note, in this connection, that deletion of respectively is required not only in cases such as (289.b), in which a "collapsed" plural NP whose determiner is not [+Definite,-Generic] is dominated by PROP, but also in cases in which such an NP occurs as the subject. Thus from the structure underlying (302.a) we wish to derive (302.b) rather than (302.c):

- (302) (a) A train arrives at 10 and a train arrives at 12.  
 (b) Trains arrive at 10 and at 12.  
 (c) \*Trains arrive at 10 and at 12 respectively.

In order to block the generation of ungrammatical strings such as (302.c) and (297.a), we propose the following Respectively-Deletion rule.

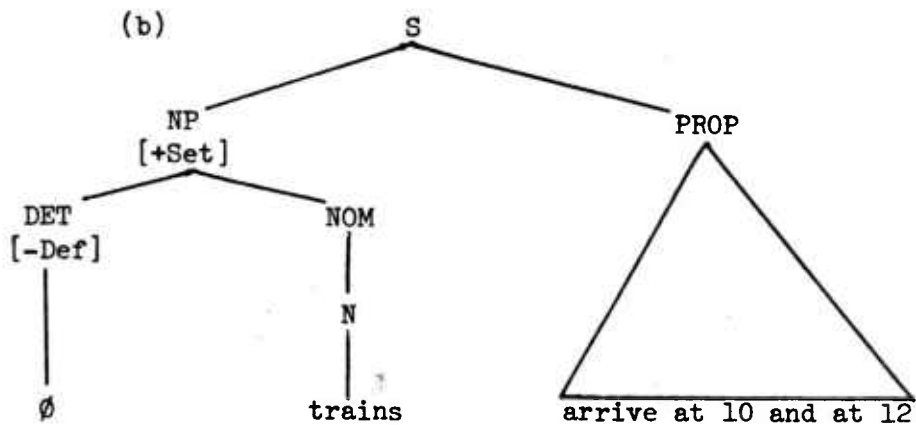
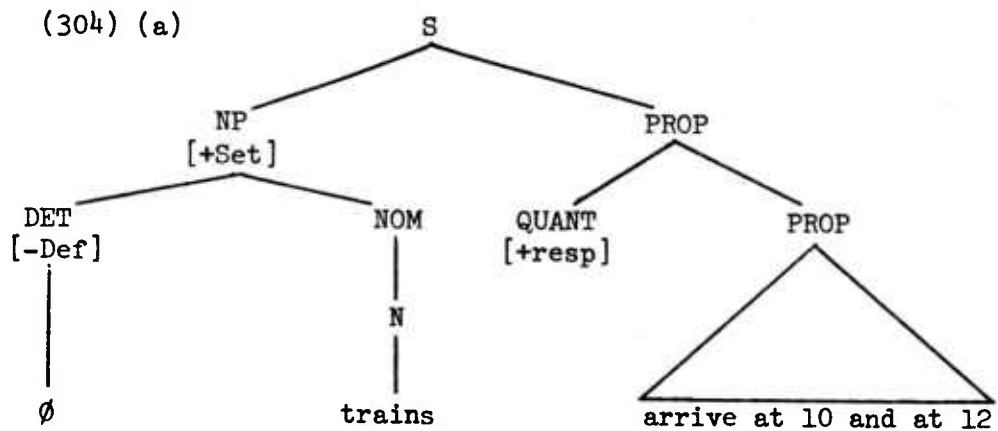
(303) SI: NP -        [-QUANT - X] - X  
                       PROP [+resp]

                  1        2        3        4        5

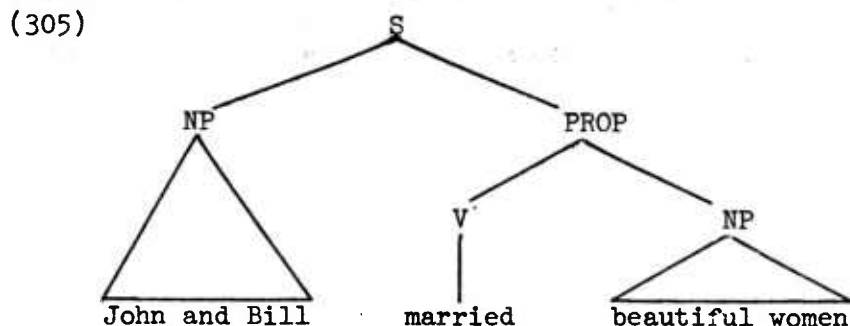
- SC: (a) Delete 2  
 (b) Delete 3

Conditions: Either: (a) 1 does not include CONJ [+and]  
 or DET [+Def,-Gen]  
 or: (b) 4 does not include CONJ [+and]  
 or DET [+Def,-Gen]

This rule will apply through Condition (a), to a structure such as (304.a), changing it to (304.b):

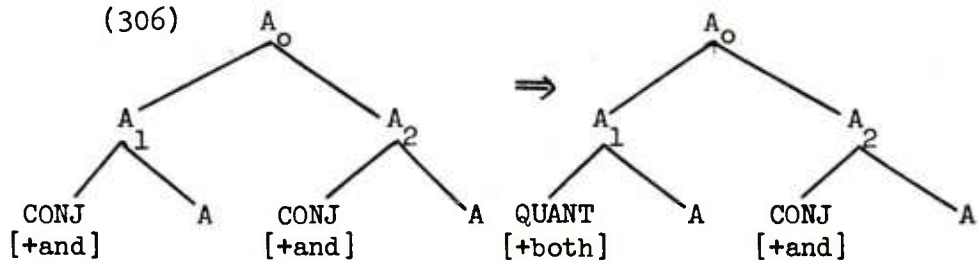


Similarly, it will apply, through Condition (b), to a structure such as (289.b), changing it to, roughly, (305):



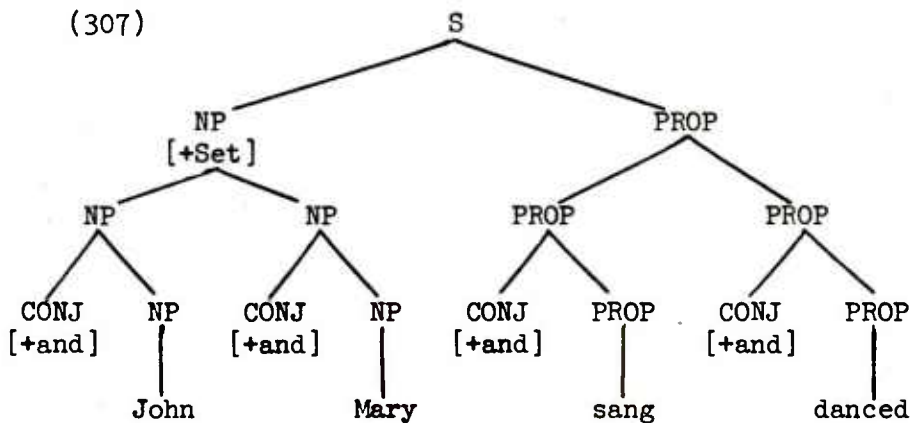
I. Both Insertion (optional)

The Both Insertion schema has the following form:



- Conditions:
- (1)  $A_1$  and  $A_2$  are the only daughters of  $A_0$
  - (2)  $A \neq S$
  - (3) The sentence of which  $A$  is a constituent does not include a  $QUANT^0$  [+resp] introduced in the same cycle.

Given a structure that conforms to the conditions on the schema, the schema operates, optionally, to replace the initial CONJ [+and] of the structure by QUANT [+both]. The tree (307), for example, includes two structures, the topmost NP and the topmost PROP, that conform to the conditions on the schema:



Operating upon (307), the schema may replace the initial CONJ [+and] of the NP, that of the PROP, or both, by QUANT [+both]. The ultimate results of the operation of the schema upon (307) are therefore any of the following:

- (308) (a) Both John and Mary sang and danced.
- (b) John and Mary both sang and danced.
- (c) Both John and Mary both sang and danced.

(In its written form, (308.b) is ambiguous. That is, it may represent the result of application of the Quantifier Movement rule (cf. Section III.M, below) to the structure immediately underlying (308.a), or it may, as is intended here, represent the result of the application of the Both Insertion schema to the PROP, rather than the NP, of (307). In speech, (308.b) would usually be unambiguous, since stress and intonation would usually differentiate the two possible derivations.)

Some other examples of products of the Both Insertion schema are:

- (309) (a) John is both intelligent and handsome.
- (b) I gave both a nickel to the boy and a dime to the girl.
- (c) John came here both yesterday and the day before yesterday.
- (d) He answered the questions both quickly and correctly.
- (e) She both can and will finish the job today.

The first condition on the schema prevents the insertion of both in cases where there are more than two conjuncts. Thus it blocks such strings as:

- (310) (a) \*Both John and Mary and Bill sang.
- (b) \*John both sang and danced and played.

(The strings (310.a) and (310.b) are, however, grammatical given an appropriate hierarchical organization of the conjoined structures. For example, (310.a) is grammatical if it is paraphrasable as 'John and both Mary and Bill sang' or 'Bill and both John and Mary sang.' Such cases, of course, do not represent a violation of Condition (1) on the schema.)

The second condition on the schema prevents the insertion of both when the two conjuncts are dominated by S. Thus it blocks such strings as:

- (311) (a) \*Both John sang and Mary danced.  
 (b) \*Both John gave, and Bill lent, some money to Susan.

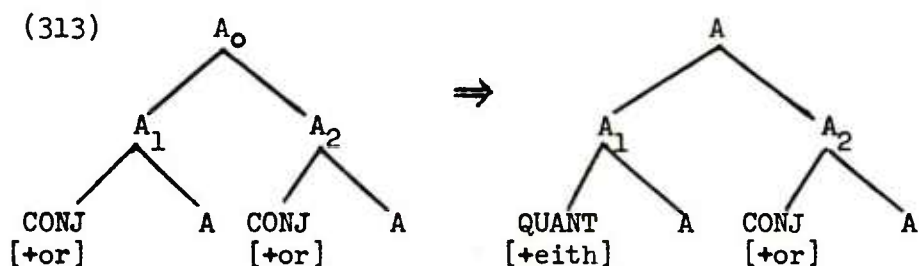
(The ungrammatical (311.b) may be compared with the grammatical (309.b). As (309.b) shows, both insertion is not excluded in general in cases of "secondary conjunction", but it is excluded in cases of secondary conjunction such as (311.b), in which the conjuncts are not subject to Node Relabeling (cf. Section III.B), and hence are identified as S's at the point at which the Both Insertion schema applies.)

The third condition on the schema, to the effect that Both Insertion is not permitted if the sentence includes an occurrence of QUANT [+resp] (i.e., respectively or respective) that has been introduced in the same cycle, blocks strings such as (311.a) or (311.b), but permits grammatical (if awkward) sentences such as (311.c) or (311.d), in which both and respectively or respective have been introduced in different cycles:

- (312) (a) \*Both John and Mary sang and danced respectively.  
 (b) \*Both John and Mary visited their respective mothers yesterday.  
 (c) Both John and Mary tutored Billie and Susie in reading and arithmetic respectively.  
 (d) Both John and Mary tutored Billie and Susie in their respective weak subjects.

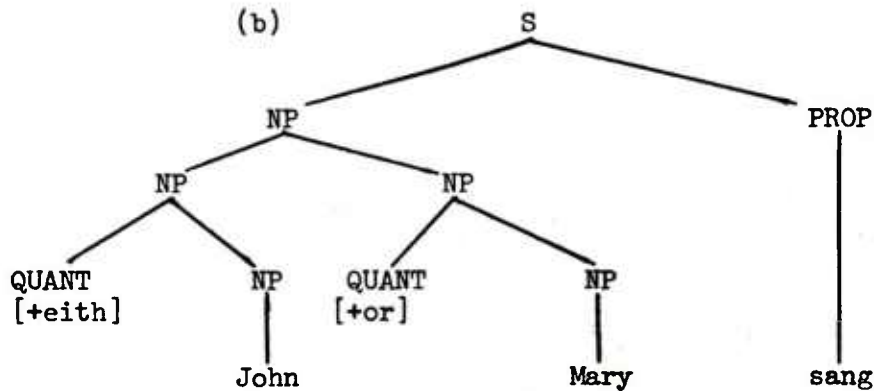
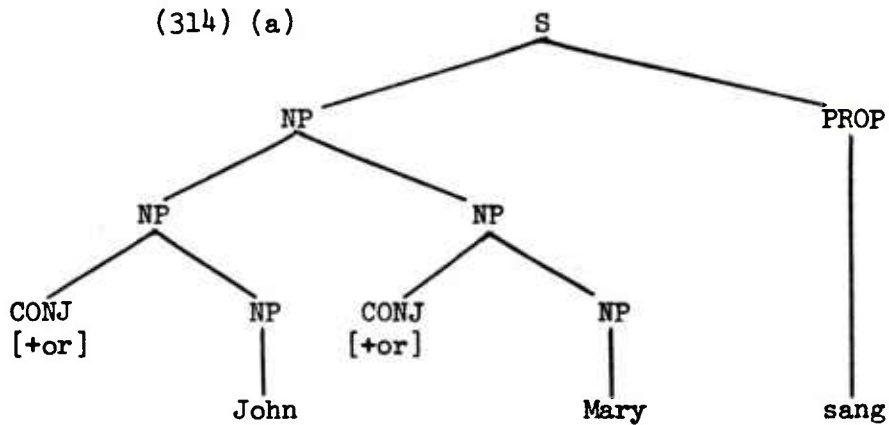
#### J. Either Insertion (optional)

The Either Insertion schema (313) is quite similar to the both Insertion schema (306), but has fewer conditions on it:



Condition:  $A_1$  and  $A_2$  are the only daughters of  $A_0$

The schema operates, for example, to change (314.a) to (314.b):



(Either John or Mary sang.)

Further examples of products of the Either Insertion schema are:

- (315) (a) John either sang or danced.
- (b) Bill is either lazy or stupid.
- (c) He gave either a nickel to the boy or a dime to the girl.
- (d) John came here either yesterday or the day before yesterday.
- (e) Either John sang or Mary danced.
- (f) Either John gave, or Bill lent, some money to Susan.



As is evidenced by (315.e) and (315.f), either, unlike both, may occur at the beginning of a conjoined structure in which the conjuncts are S's. Like both, however, either is, at least in the dialect described here, limited to occurrence in conjoined structures with exactly two conjuncts. Thus there is a condition on the Either Insertion schema which prevents the derivation of strings such as (316):

- (316) (a) \*Either John or Bill or Helen sang.  
 (b) \*John either sang or danced or played.

(As in comparable cases involving both--e.g., (310)--strings like (316) are grammatical if they reflect a hierarchical organization such that the condition in question is not violated. Thus (316.a) is grammatical if it is paraphrasable by 'John or either Bill or Helen sang' or 'Helen or either John or Bill sang.')

#### K. All Insertion (optional)

Unlike both (and either), all can, in general, be introduced only as a constituent of an NP. Thus, while (317.a) is grammatical, (317.b) and (317.c) are not:

- (317) (a) John and Bill and Harry all sang.  
 (b) \*John sang and danced and played all.  
 (c) \*John is rich and handsome and intelligent all.

A further constraint on all, at least when it is a constituent of an NP involving conjunction, is that the NP of which it is a constituent cannot be sentence-final (or clause-final). Thus (318.a) is grammatical but (318.b) is not:

- (318) (a) I gave John and Bill and Harry all presents.  
 (b) \*I gave presents to John and Bill and Harry all.

(It is not this latter constraint that is responsible for the ungrammaticalness of (317.b) and (317.c) however, since all generally cannot occur as a constituent of a structure other than an NP regardless of whether or not this structure is sentence-final.) (It may be noted that all does occur as a constituent of a sentence-final NP headed by a personal pronoun: e.g.,

- (319) I gave presents to them all.)

In conjoined NP's, all and both are in complementary distribution, all occurring only if there are three or more conjuncts, both only if there are exactly two conjuncts. All is further differentiated from both by the fact that the Quantifier Movement rule (cf. III.M, below), which is optional for both, is obligatory for all in a conjoined structure. Thus:

- (320) (a) \*All John and Bill and Harry passed.
- (b) John and Bill and Harry all passed.
- (c) Both John and Bill passed.
- (d) John and Bill both passed.

(When all occurs in an NP that does not involve conjunction, however, Quantifier Movement is optional:

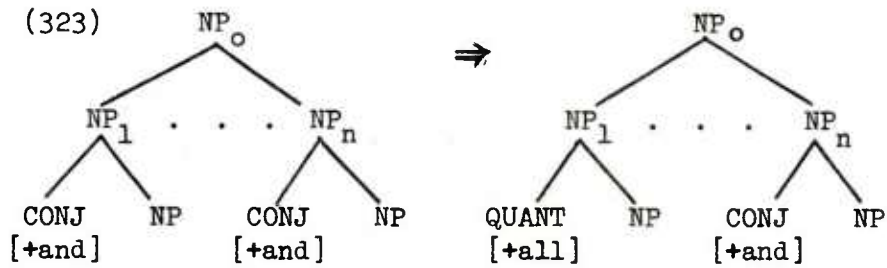
- (321) (a) All (of) the students passed.
- (b) The students all passed.)

There is one constraint that is common to All Insertion and Both Insertion: all, like both, cannot be inserted into a structure that includes an occurrence of respectively or respective that has been inserted in the same cycle. Thus the following are ungrammatical:

- (322) (a) \*John and Bill and Harry all sang and  
          danced and played respectively.
- (b) \*John and Bill and Harry all visited their  
          respective mothers yesterday.

(There may be differences of opinion about the grammaticalness of (322.b). If such examples are judged to be grammatical, the third condition on the All Insertion schema (323) below can be revised so as to permit All Insertion in a sentence that includes a QUANT [+resp] dominated by DET(erminer)--i.e., respective--but still exclude All Insertion when QUANT [+resp] is not so dominated.)

Except for the obligatory application of the Quantifier Movement rule, which must be treated in connection with that rule itself, all of the above observations concerning all in conjoined structures are incorporated into the following statement of the All Insertion schema:

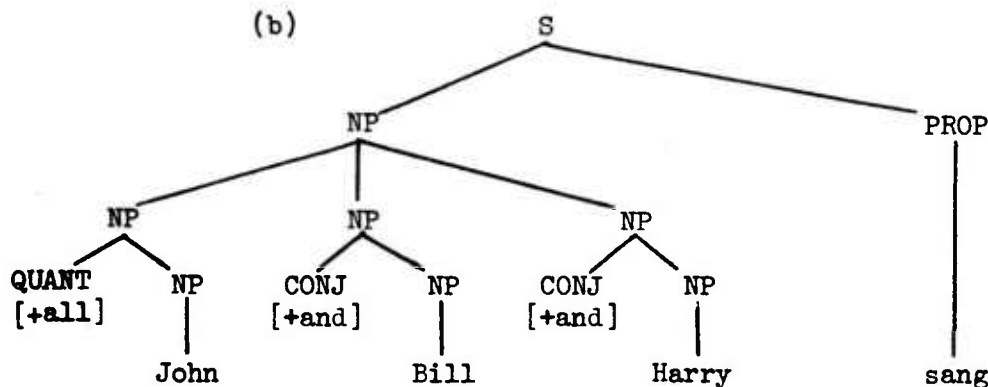
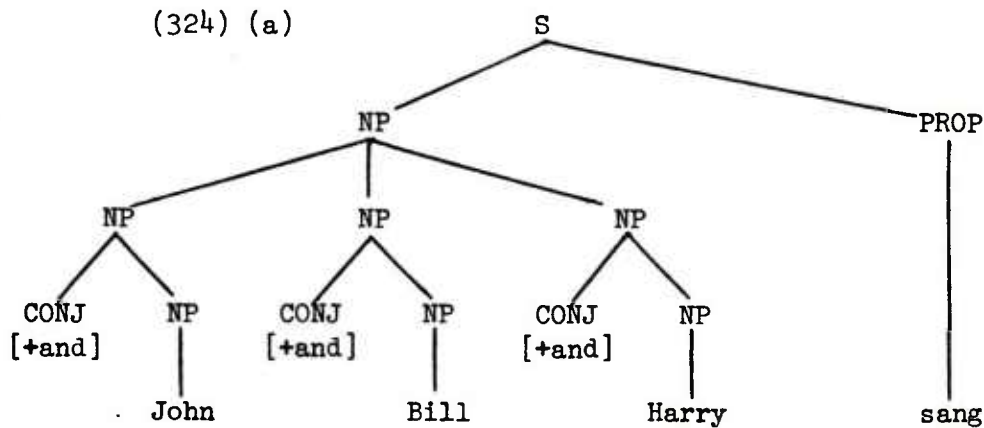


Conditions: (1)  $n \geq 3$

(2)  $NP_o$  is not immediately followed by # (sentence boundary).

(3) The sentence of which  $NP_o$  is a constituent does not include a  $QUANT [+resp]$  introduced in the same cycle.

The schema operates, for example, to change (324.a) to (324.b):



(Ultimately: John and Bill and Harry all sang.)

L. Each Insertion

The conditions for Each Insertion are quite similar to those for All Insertion. Like all, each must generally be a constituent of an NP. Thus (325.a) is grammatical but (325.b) and (325.c) are not:

- (325) (a) John and Bill each sang.  
 (b) \*John sang and danced each.  
 (c) \*John is rich and handsome each.

Again like all, each cannot be a constituent of a sentence-final NP. Thus while (326.a) is grammatical, (326.b) is not: \*

- (326) (a) I gave John and Bill each a present.  
 (b) \*I gave a present to John and Bill each.

A further similarity between each and all (and, in this case, both as well) is seen in the restriction of Each Insertion to sentences that do not include an occurrence of respectively or respective introduced in the same cycle. Thus the following are ungrammatical:

- (327) (a) \*John and Bill each sang and danced respectively.  
 (b) \*John and Bill each visited  
       {their respective mothers.}  
       {his respective mother. }

(One final similarity between each and all is that Quantifier Movement is obligatory for both each and all when they occur as constituents of conjoined structures. Thus, like (322.a), the following are ungrammatical:

- (328) (a) \*Each John and Bill sang.  
 (b) \*I gave each John and Bill a present.)

Each differs from all in that it may occur as a constituent of an NP involving only two conjuncts, as well as of an NP involving three or more conjuncts. Thus:

- (329) John and Bill (and Harry) each sang.

A further difference between each and all is that Each Insertion, unlike All Insertion (or Both Insertion), is restricted to sentences in which the Plural Collapsing schema (cf. III.G) has not applied in the same cycle. Consider the sentences:

- (330) (a) John and Bill and Harry all bought cars.
- (b) John and Bill and Harry each bought cars.

Sentence (330.a) might be derived from, among other sources, the structure underlying either (331.a) or (331.b):

- (331) (a) John bought a car and Bill bought a car  
and Harry bought a car.
- (b) John bought cars and Bill bought cars  
and Harry bought cars.

Sentence (330.b), on the other hand, can, at least in some dialects, only be derived from the structure underlying (331.b). (For a contrary opinion, cf. Dougherty (1967b).)

A problem arises in connection with the derivation of sentences such as:

- (332) John and Bill each bought one car.

Presumably this sentence is derived from the structure underlying:

- (333) John bought one car and Bill bought one car.

After the Derived Conjunction and Node Relabeling schemata have applied to the structure underlying (333), the Identical-Conjunct Collapsing schema results in a structure which, if the Each Insertion schema is not applied, is ultimately realized as:

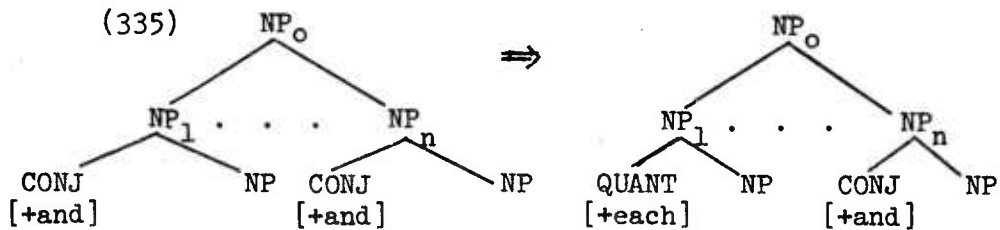
- (334) John and Bill bought one car.

But if we compare (334) with (332), it is clear that the sentences have different meanings. In the interpretation of (334) only a single car is involved, while in that of (332) two different cars are involved.

In discussing the Identical-Conjunct Collapsing schema (cf. III.C), we noted that application of this schema to a set of formally identical NP's was equivalent to treating the NP's as referentially identical. Thus the interpretation of one car in (334) is the expected result of application of the Identical-Conjunct Collapsing schema, while the interpretation of one car in (332) is an unexpected result. We shall say that the interpretation of (332) depends upon the meaning of each itself, which involved some such notion as "distributive", and which overrides

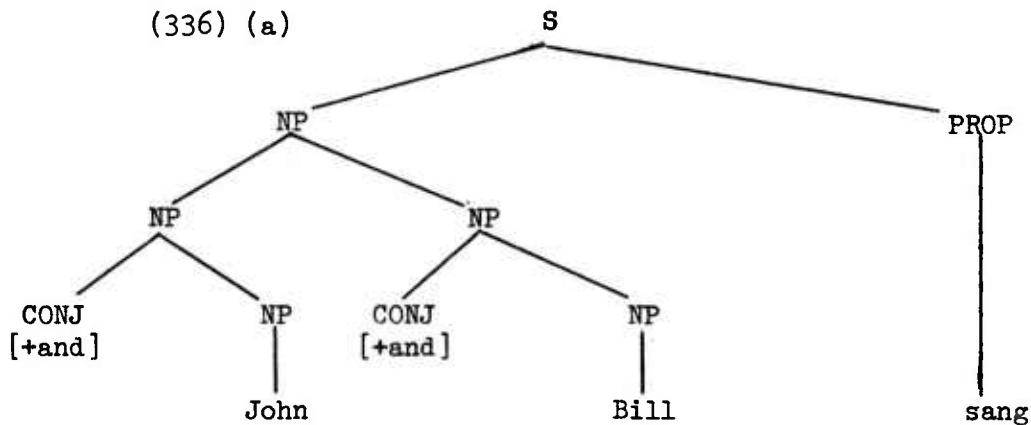
the usual interpretation of singular NPs as having a single referent. Therefore, the statements made in Section III.C concerning the interpretation of NP's that result from Identical-Conjunct Collapsing must be qualified so as to exclude those cases where Each Insertion has also applied.

The Each Insertion schema may be stated as follows:

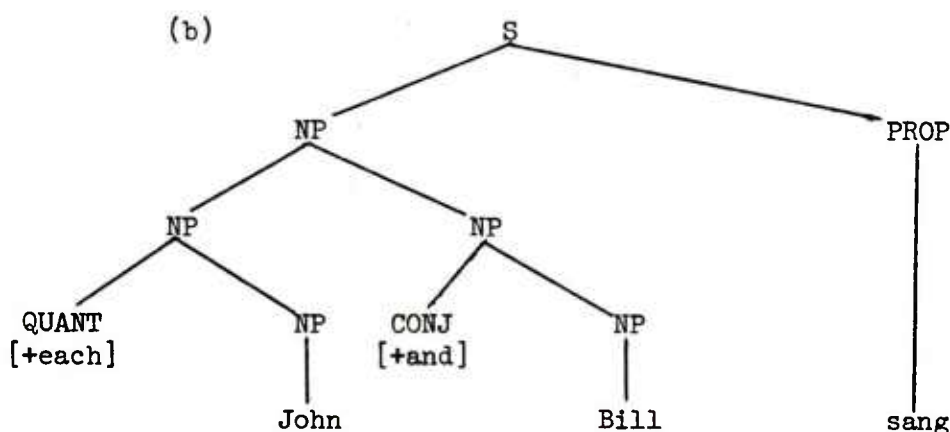


- Conditions:
- (1)  $NP_0$  is not immediately followed by # (sentence boundary)
  - (2) The sentence of which  $NP_0$  is a constituent does not include a  $QUANT [+resp]$  introduced in the same cycle.
  - (3) The Plural Collapsing schema has not been applied in the same cycle.

The schema operates, for example, to change (336.a) to (336.b):







(Ultimately: John and Bill each sang.)

#### M. Quantifier Movement (partly optional)

Schemata have been presented for introducing five quantifiers--respectively, both, either, all, and each--as initial constituents of certain conjoined structures. With the exception of either, each of these quantifiers is subject to a rule that moves the quantifier to the end of the constituent into which it has been introduced, or, in some cases, into certain other positions in the sentence. Since this rule also applies, in the cases of both, all, and each, to occurrences of the quantifiers as constituents of non-conjoined structures, the rule itself is presented elsewhere in this text (cf. DETERMINERS). In the present section, we shall simply summarize some of the special characteristics of Quantifier Movement in cases where the quantifiers have been introduced by one or another of the conjunction schemata.

When both occurs as a constituent of a conjoined structure, then, application of the Quantifier Movement rule is optional. Thus all of the following are grammatical:

- (337) (a) Both John and Mary both sang and danced.  
 (b) John and Mary both both sang and danced.  
 (c) Both John and Mary sang and danced both.  
 (d) John and Mary both sang and danced both.

When, on the other hand, respectively, all, or each, occurs as a constituent of a conjoined structure, application of the Quantifier Movement rule is obligatory. Compare the ungrammatical strings of (338) with the grammatical sentences of (339):

- (338) (a) \*Respectively John and Mary sang and danced.  
 (b) \*John likes, and Mary dislikes, respectively meat and fish.  
 (c) \*All John and Bill and Harry passed.  
 (d) \*Each John and Bill bought a car.
- (339) (a) John and Mary respectively sang and danced.  
 (b) John likes, and Mary dislikes, meat and fish respectively.  
 (c) John and Bill and Harry all passed.  
 (d) John and Bill each bought a car.

(Example (338.d) is grammatical in the sense 'Each John and each Bill bought a car,' but it is ungrammatical as a paraphrase of (339.a).)

While the Quantifier Movement rule applies obligatorily to respectively, it should be noted that the rule never applies to respective. Thus (340.a) is grammatical but (340.b) is not:

- (340) (a) John and Mary visited their respective mothers.  
 (b) \*John and Mary visited their mothers respective(ly).

As was explained in Section III.H, respectively and respective are both represented in the (second) lexicon as [+QUANT,+resp], but are distinguished on the basis of the configurations in which they occur, respective being the item that corresponds to an occurrence of [+QUANT,+resp] that is dominated by DET(erminer), respectively the item that corresponds to all other occurrences of [+QUANT,+resp]. Although respectively and respective are not distinct with respect to their inherent features, there is no problem in blocking the application of the Quantifier Movement rule in the case of respective, since this is an automatic consequence of the position of the quantifier. That is, the Quantifier Movement rule applies only to quantifiers that are the initial constituents of structures, and occurrences of [+QUANT,+resp] that are to be realized as respective are, as a result of the Respectively → Respective schema (cf. III.H), never in initial position at the point in the rules at which Quantifier Movement applies.

#### N. Initial-Conjunction Deletion (obligatory)

As a result of the Conjunction Spreading schema (cf. III.E), a conjunction that is left sister of a set of conjuncts is copied as left sister of each member of the set, including the initial member. In some cases the conjunction that is left sister of the

initial conjunct is replaced by a quantifier: thus an initial and may in appropriate cases, be replaced by respectively, both, all, or each, and an initial or may be replaced by either. In other cases, the Plural Collapsing schema (cf. III.G) deletes an initial and (together with all other occurrences of and in the affected structure).

When an initial conjunction has not been replaced or deleted by previous schemata, it is obligatorily deleted by the Initial-Conjunction Deletion rule, which has the form:

(341) SI: X - CONJ - X

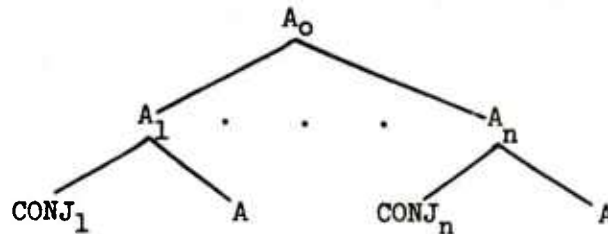
1      2      3

SC: Delete 2

Condition: 2 is the first daughter of a non-immediately dominating constituent

The condition on (341) assures that only an initial conjunction is deleted. This is because, at the point at which Initial-Conjunction Deletion applies, all conjoined structures in which the initial conjunction has not been replaced by a quantifier have the form:

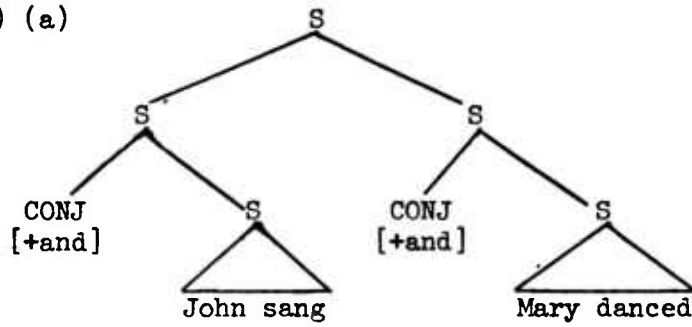
(342)



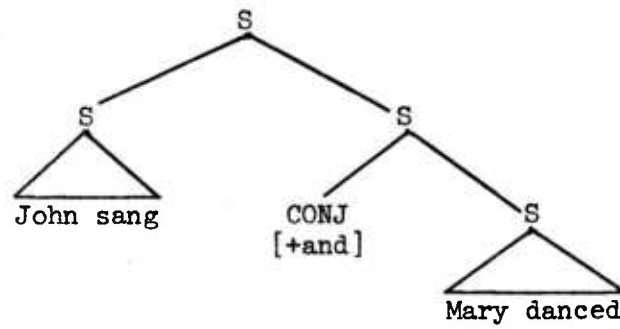
It is clear from (342) that only  $CONJ_1$  is the first daughter of a non-immediately dominating constituent: namely,  $A_0$ .  $CONJ_n$ , on the other hand, while it is the first daughter of an immediately dominating constituent,  $A_n$ , is not the first daughter of any other constituent.

The Initial-Conjunction Deletion rule, in combination with a (here-unstated) "pruning" rule, operates, for example, to change (343.a) to (343.b), (343.c) to (343.d), and (343.e) to (343.f):

(343) (a)

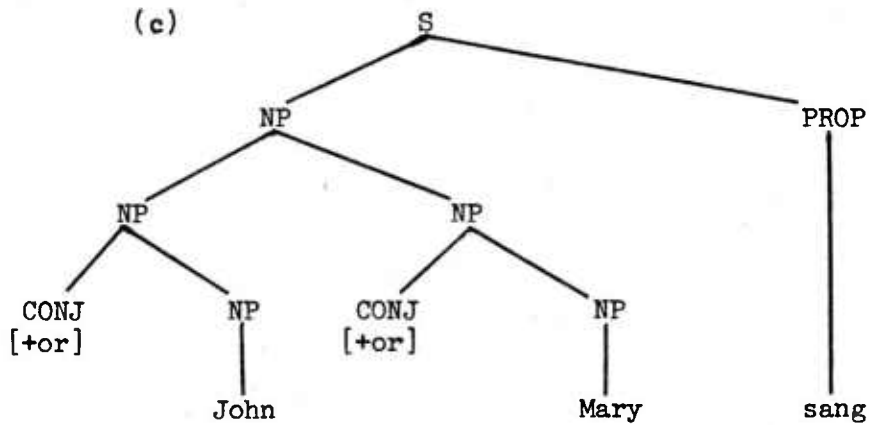


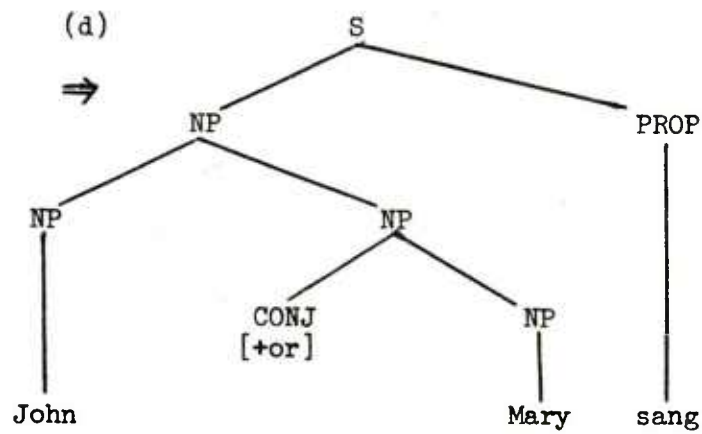
(b)



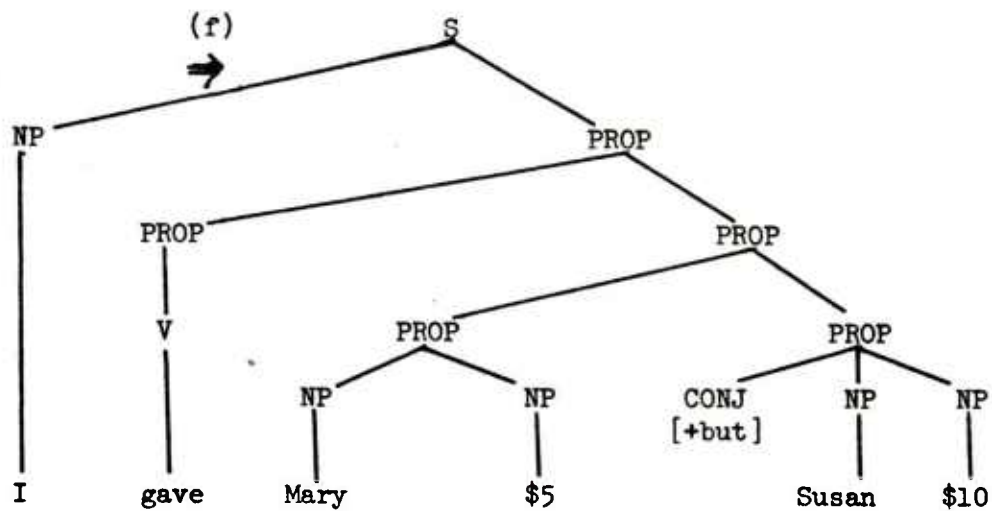
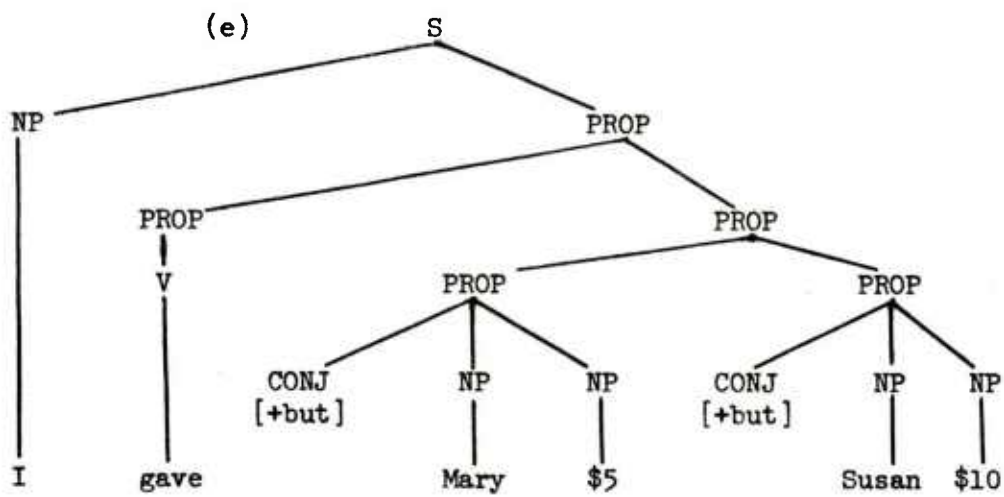
(John sang and Mary danced.)

(c)





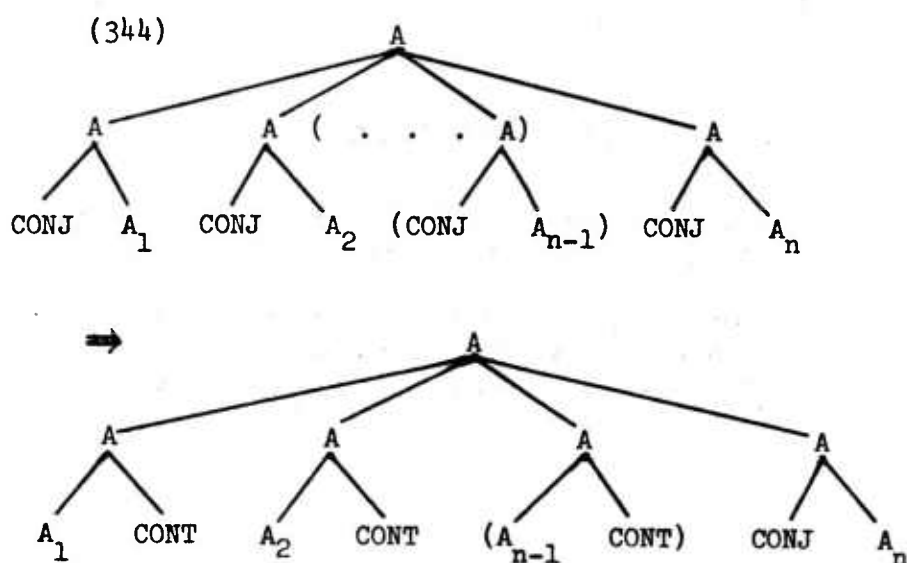
(John or Mary sang.)



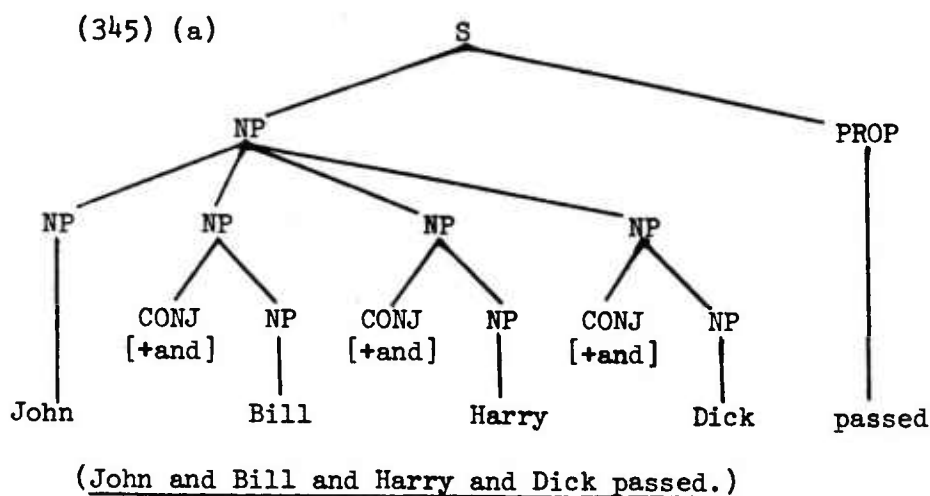
(I gave Mary \$5 but Susan \$10.)

## O. Medial-Conjunction Deletion (optional)

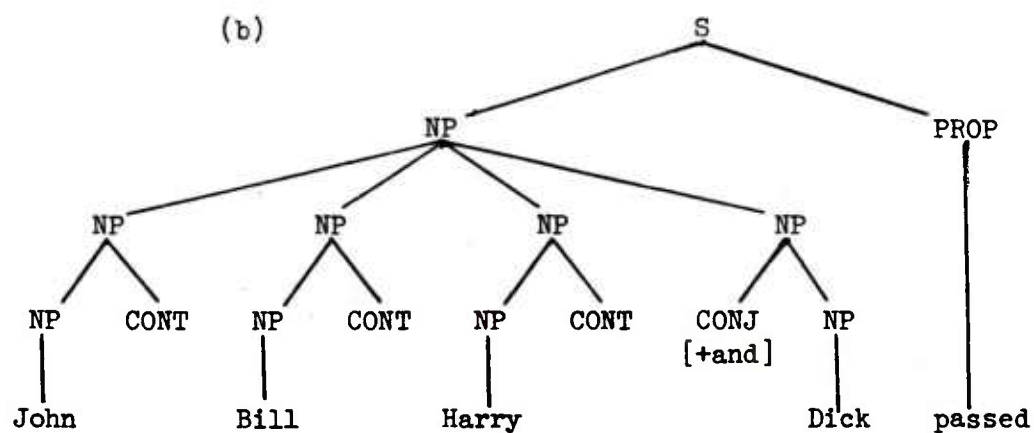
The Medial-Conjunction Deletion schema operates optionally upon conjoined structures that include three or more conjuncts. (Since, as was pointed out in Section III.A.3, but always occurs with exactly two conjuncts, the schema is necessarily restricted to structures that involve and- or or-conjunction.) The schema operates to delete all but the last conjunction from the structure, and to Chomsky-adjoin a marker of rising intonation (CONT for "continuing") to all but the last of the conjuncts. The schema may be stated as follows:



An example of its operation is the change of (345.a) to (345.b)







(John, Bill, Harry, and Dick passed.)

Some further examples of sentences that reflect the operation of the Medial-Conjunction Deletion schema are:

- (346) (a) John sang, Bill danced, and Harry played.  
(b) John will sing, dance, and play.  
(c) John sang, Bill danced, or Harry played.  
(d) John will sing, dance, or play.

September 1968

# RELATIVIZATION

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## II. INTRODUCTION

A sentence embedded as modifier of an NP, the embedded sentence having within it a WH-pronominal replacement for an NP which is in some sense identical with the head NP, is a relative clause. Relative clauses are of at least two types: restrictive and appositive (or non-restrictive). It may well be useful to discriminate a third type, pseudo-relative clauses, which appear only in generic noun phrases and are perhaps related to conditional sentences. These are taken as a type of restrictive relative clause in the analysis presented in this paper.

Appositive relative clauses are not analyzed in detail in the body of this paper. Ross (1967c) and others have proposed that appositive relatives derive from conjoined sentences, with the second conjunct inserted into the first, as in (1):

- (1) (a) The plane finally crashed, and it had never flown well anyway.  
 (b) The plane, which had never flown well anyway, finally crashed.

The difficulty with this proposal (pointed out by Ross, 1967c, Section 6.2.4.1) is that although a declarative cannot be conjoined with an interrogative or an imperative, relatives do occur within interrogatives and imperatives: Is even Clarence, who is wearing mauve socks, a swinger? [Ross, 1967c, 6.158] Ross therefore proposes, rather unhappily, that appositive relatives may come not from conjoined sentences but from the corresponding sequence of two independent sentences: Is even Clarence a swinger? He is wearing mauve socks. [6.160]

Appositive relative clauses differ from restrictive relatives in many ways:

Appositives, but not restrictives, require comma intonation after the head NP.

Restrictives, but not appositives, permit that as a relative pronoun.

Appositives, but not restrictives, may modify proper nouns that have no determiners: \*John, that came early, also left early.

Restrictives, but not appositives, may modify any + N.  
\*Any plane, which crashes, is a failure.

Appositives, but not restrictives, may modify an entire proposition (He said he would resign, which I thought was a good idea.)

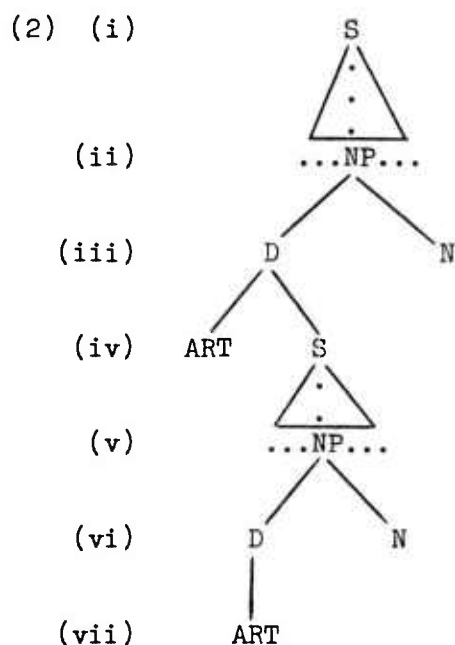
The constraints which determine what can be fronted along with the shared NP in the relative clause are not the same in the two types: cf. The crimes, over which his anguish was intense, were less serious than he thought; but not \*The crimes over which his anguish was intense were less serious than he thought.

The present discussion is devoted exclusively to restrictive relative clauses.

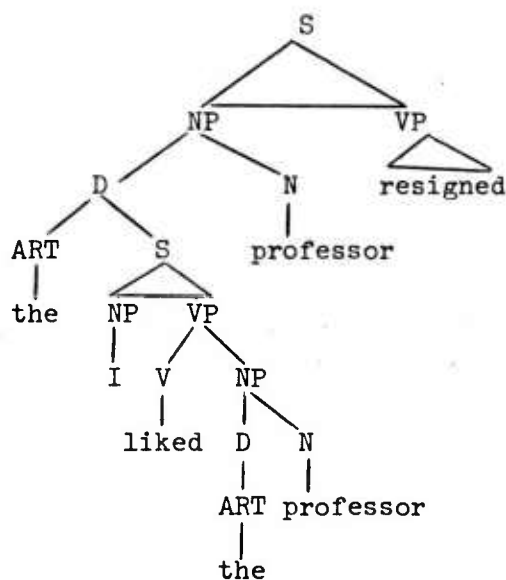
## A. The Art-S Analysis

## 1. Structure

The earlier formulations of the deep structure of restrictive clauses (notably, Smith, 1964), continuing into several recent formulations including that of Chomsky's Aspects of the Theory of Syntax, analyzed these clauses as sentences embedded in the Determiner constituent of the noun phrase. This formulation is referred to as the ART-S analysis, having the P-marker of (2):



E.g.



"The professor that I liked resigned"



In the ART-S analysis, the relative clause is explicitly assigned a constituency within the determiner, thus claiming that its grammatical function is closely related to that of other constituents of the determiner, namely to delimit the potential domain of reference of the head noun.

There are at least two kinds of evidence that the relative clause is part of the determiner, as the ART-S analysis claims.

(1) There is a class of words that cannot occur unless there is either a relative clause or some kind of demonstrative determiner: way, kind, manner, time, place, words which are themselves prototypes of their class and not subject to ordinary pronominalization (Kuroda, 1968). Thus \*He did it in a/the way; but He did it in a certain way, He did it in that way, He did it in a/the way that I prescribed; \*She is a kind of person, but She is that kind of person, She is the kind of person that I admire; examples of a similar kind are cited by Jackendoff (1968f) and Perlmutter (1968b). This correlation with deictics led Jackendoff (1968f) to refer to this class of relative clauses as the demonstrative relative; a number of the relevant observations about them were made by Lees (1961c).

(2) The post-positioning of possessives correlates with the occurrence of any determiner in addition to ART, including the relative clause: thus that book of John's, John's book, \*that John's book, \*John's book that is on the table, a book of his that is on the table, \*his book that is on the table, \*the book of his.

These same facts hold with ADJ in the NP: \*She does things in a way, but She does things in a strange way, She does things in a way that is strange. Within the ART-S analysis, then, it is possible to state a contextual constraint on the insertion of nouns like way, manner, etc., namely that the determiner within them cannot consist solely of [-DEM] [ART]. It is not obvious how this constraint can be generalized under the alternative analyses, NP-S and NOM-S, discussed below.

## 2. Problems

There are three problems with the ART-S analysis which have led various transformationists to propose alternative analyses:

- a. If the identity condition is stated to hold between the N of (2.iii) and the N of (2.vi), then a problem arises with self-embedding of restrictive relatives as in (3), unless the clause-positioning rule is formulated with great care (see Section IX.C):

(3) (a) The S horse won the race.

The S horse finished fast.

The horse started late.

(b) \*The horse that that started late finished fast won the race.

Terence Moore (1967) has argued that sentences of the type thus generated by the ART-S analysis are clearly ungrammatical. That is, they are not merely difficult to interpret because of performance considerations, as can be plausibly argued in some types of self-embedding: e.g., when both the shared NP's are subjects we get the ungrammatical result of (3), but when one is an object and the other a subject, the result is grammatical, as in (4):

(4) (a) I saw the S film.

The S director made the film.

John knows the director.

(b) I saw the film that the director that John knows made.

There are other familiar types of self-embedding, not involving relativization, that quickly become difficult at the performance level but that are clearly grammatical, as in (5):

(5) The fact that the evidence that Nick was guilty was interesting led to the wrong conclusion.

A condition which would block both (3) and (4) would have to be a general condition against self-embedding, and it would have to extend to other cases in the grammar such as (5). This is clearly wrong, so that other grounds must be found to reject (3) but retain (4).

The identity condition  $N = N$  should probably be rejected anyway in view of the fact that the notion the identity condition seeks to capture is that of coreferentiality, which holds only between definite NP's, not between two occurrences of the same N. The evidence that the relative pronouns who/which/that are in fact definite pronouns (like he, she, it), and therefore coreferential in whatever way and to whatever extent he/she/it are (see PRO), is the same evidence that suggests they belong in the determiner: namely that restrictive relative clauses correlate precisely, in their cooccurrence potential, with demonstratives: \*...in a manner, \*...in the manner, ...in a manner that I admire, ...in that manner.

And since demonstratives have the features [+DEM] [+DEF] (see PRO), it would appear that if the coreferential NP of the relative clause is not at least definite (and possibly even deictic), the identity condition could not be met in these instances.

b. If, in order to capture the notion coreferentiality which holds only between NP's, and therefore is lost under the proposal (a) that identity is  $N = N$ , the identity condition is stated to hold between the NP of (2.ii) and the NP of (2.v), then no relative clauses whatever can be generated, since the NP of (2.ii) contains an embedded sentence, namely the S of (2.iv), whereas the NP of (2.v) cannot contain that S. Clearly, then, identity between NP's, unless defined in such a way as to exclude the embedded S which is to be relativized, is impossible under the ART-S analysis.

c. If coreferentiality is stated to hold between the article and its head noun, on the one hand, and the article and its head noun in the embedded S (i.e. between the ART of (2.iv) with its head noun (2.iii), and the ART of (2.vii) with its head noun (2.vi)), then the problem of (b) is removed. Notice, however, that the self-embedding of (3) is stacked -- i.e., the higher relative clause (The horse finished fast) must be interpreted as modifying the head plus the lower relative clause (The horse that started late). As a rough paraphrase, Of the horses that started late, the one that finished fast won the race. For some speakers such stacking is grammatical in the form (6):

- (6) The horse that started late that finished fast won the race.

For other speakers the sense of (6) is possible only in the form (7):

- (7) (a) The horse that started late and that finished fast won the race.  
(b) The horse that started late and finished fast won the race.

For speakers of the dialect represented by (7), a constraint against stacking would automatically serve to disallow the ungrammatical (3). Such a constraint is statable by specifying that there be no S embedded within the coreferential NP of the relative clause (i.e. by a constraint specified in the structure index of the relative clause transformation itself). The question of stacking is viewed in this analysis as a matter of dialect differentiation, and the kinds of sentences on which different judgments are made by speakers of different dialects are discussed under the analyses below that are more appropriate to the generation of stacked relative clauses like (6).

It turns out, in fact, that the relative-clause-positioning rule (which moves the relative clause to the right of the head noun) can be stated in such a way as to preserve a stacked interpretation even under the ART-S analysis. See rule IX.C. in this paper.

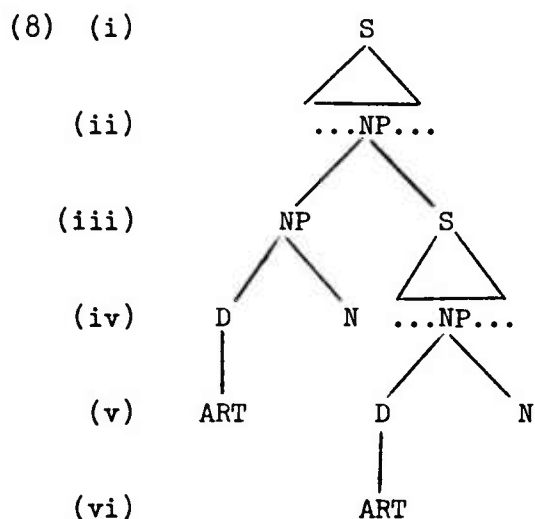
General constraints on relativization, such as those proposed by Ross (1967c), are shared with both NP-S and NOM-S, and are discussed subsequently in this presentation.

## B. The NP-S Analysis

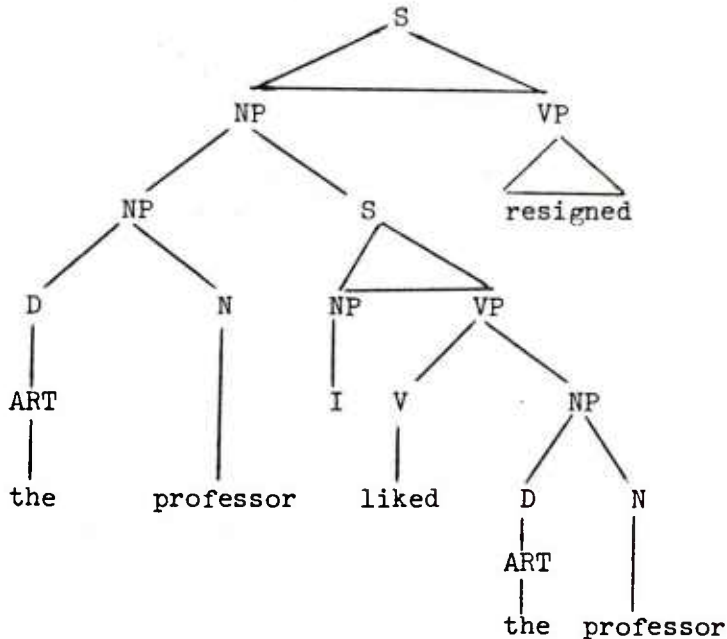
### 1. Structure

Because of the grammaticality (for some dialects) of examples like (6), and the ungrammaticality for all dialects of examples like (3), a different analysis of restrictive relative clauses has been widely assumed (though not in fact extensively discussed or defended in the available literature), e.g. by Ross (1967c).

This formulation is referred to as the NP-S analysis, having the P-Marker of (8):



E.g.



"The professor that I liked resigned"

The putative advantage of this analysis is that the identity condition can be stated on the shared NP's without having the derivation block (see Section (A.1.b.) above). Since the shared NP of the relative clause is pronominalized by the head NP, and since the pronominalized forms who/which/that appear to be definite pronouns (like he, she, it, derived from definite articles), which involve the strongest possible identity condition -- namely, coreferentiality -- WH-pronominalization is assumed to require coreferentiality also.

## 2. Problems

### a. Relativization with Generic NP

From the requirement of coreferentiality under the NP analysis many problems follow. A different source for relative clauses in generic NP's has to be devised, since sentences like the second one in each set below are not entailed by the first one:

- (9) (a) Every linguist who reads Chomsky can learn about transformational theory.
- (b) Every linguist reads Chomsky.
- (10) (a) All students who can spell decently will pass the course.
- (b) All students can spell decently.
- (11) (a) No missile that has insufficient velocity can escape the earth's gravitational field.
- (b) No missile has insufficient velocity.
- (12) (a) Dogs that are mammals eat more than dogs that are serpents.
- (b) Dogs are mammals. Dogs are serpents.

From (12) it appears that a general constraint against relativization is needed if the shared NP of the relative clause is generic. That is, while the head NP can be generic, the shared NP of the relative clause cannot be, since a generic paraphrase cannot be entailed by the shared NP of any relative clause. In the sentences below, neither (b), (c), nor (d) is entailed by (a), even though the head NP and the NP as a whole are clearly generic in the first example:

- (13) (a) A lion that doesn't have enough to eat is a dangerous animal.
- (b) There exists some lion that doesn't have enough to eat.
- (c) Some lions don't have enough to eat.
- (d) Lions don't have enough to eat.

In fact, the only correct paraphrase of relative clauses on generic heads seems to be if...then:

If a lion doesn't have enough to eat, it is a dangerous animal.

The attempt to derive relative clauses on generic heads from conditional sentences has difficulties of its own, but it nevertheless appears to be the correct direction to go. Jackendoff (1968f) refers to an unpublished paper on generics by Bowers (1964), which we have not seen, that makes the same claim. The difficulty pointed out by Jackendoff is that there are generic sentences like (14) for which there is no obvious conditional paraphrase:



- (14) (a) A beaver builds dams. [83]  
 (b) If something is a beaver, it builds dams. [84]

But it is not necessary to claim that all generic sentences have conditional paraphrases, or that all conditional sentences have relative clause paraphrases. The only claim is that sentences of the form

If Generic NP<sub>i</sub> VP<sub>m</sub> then Generic NP<sub>i</sub> VP<sub>n</sub>

are the source of relative clauses of the form

Generic NP<sub>i</sub> that VP<sub>m</sub> VP<sub>n</sub>

Jackendoff proposes that the paraphrase relationship that holds between relative clauses in generic NP's, and conditional sentences, is a consequence of a general interpretative rule that holds for both presentences (conditionals) and determiners (relative clauses, under the ART-S analysis).

Another problem is that of deriving a relative clause on a generic head which is itself within a conditional sentence:

- (15) (a) If this store carries a pipe that is made of briarwood, I'd like to see one/it.  
 (b) If this store carries pipes that are made of briarwood, I'd like to see them.

One possibility is to consider these as coordinate conditionals:

- (16) (a) If this store carries a pipe and if it is made of briarwood, I'd like to see it.  
 (b) If this store carries pipes and if they are made of briarwood, I'd like to see them.

Some speakers claim that (15) and (16) are not paraphrases, however; if indeed they are not, (15) poses an apparently insurmountable obstacle to the proposal to relate relative clauses on generic heads to underlying conditional structures.

The "generic quantifiers" every/all/no/any yield reasonably well to the same analysis. Thus corresponding to (9), (10), (11) there are (9'), (10'), (11'):

- (9') (a) If he reads Chomsky, every linguist can learn about transformational theory.
- (b) Every linguist can learn about transformational theory, if he reads Chomsky.
- (10') (a) If they can spell decently, all students will pass the course.
- (b) All students will pass the course, if they can spell decently.
- (11') (a) If it has insufficient velocity, no missile can escape the earth's gravitational field.
- (b) No missile can escape the earth's gravitational field, if it has insufficient velocity.

The other generic quantifiers few and each do not yield quite as well to this analysis, with the if-clause in initial position, but the paraphrase relation holds when the if-clause follows the main clause:

- (17) (a) Few scholars who ignore their predecessors succeed well.
- (b) (?) If they ignore their predecessors, few scholars succeed well.
- (c) Few scholars succeed well if they ignore their predecessors.
- (18) (a) Each apple that falls from the tree is ripe.
- (b) (?) If it falls from the tree, each apple is ripe.
- (c) Each apple is ripe if it falls from the tree.

Although few is generic, a few is an indefinite quantifier, and as with other indefinite quantifiers that cannot be interpreted as generic the paraphrase relation between the head NP and the REL-NP is retained:

- (19) (a) A few men who went to bed early failed to see the aurora borealis.
- (b) A few men went to bed early.  
[Or, with definitivization of the shared NP, "The few men went to bed early."]
- (c) Several men who left early missed the fun.
- (d) Several men left early.

The contrast between (19.a), which entails (19.b), and (20.a), which does not entail (20.b), provides reasonable motivation for the claim that the surface structure of relative clauses derives from two distinct sources -- the ordinary relative from embedding of an S within non-generic NP's [whether as in (2) or as in (8)], and the pseudo-relative from reduction of a conditional sentence that contains a shared generic NP in the two halves:

- (20) (a) Few men who go to bed early get to see the  
aurora borealis.  
(b) Few men go to bed early.

For reasons not understood, with few (generic) the conditional clause must follow the matrix, not precede it.

- (21) (a) Few men get to see the aurora borealis if  
they go to bed early.  
(b) (?) If they go to bed early, few men get to see  
the aurora borealis.

Evidence favoring the conditional proposition as the source of what appear superficially to be relative clauses in generic NP's, other than the considerations of entailment outlined above, is thin but indicative: the tense constraints that have been investigated for conditional sentences [Barbara Hall (1964a)] include a constraint against simple predictive will in the if...portion of the condition.

- (22) (a) \*If any train will arrive on time, it will be  
greeted by a marching band.  
(b) If any train arrives on time, it will be  
greeted by a marching band.

This constraint carries over to the pseudo-relative clause:

- (23) (a) \*Any train that will arrive on time will be  
greeted by a marching band.  
(b) Any train that arrives on time will be greeted  
by a marching band.

#### b. Definitivization

One of the motivations of the NP-S analysis is to enable the identity condition of the shared NP's to be stated in the strong form of whole NP coreferentiality; in order to allow relativization

on indefinite NP's, as in (24), and yet guarantee that WH-pronominalization will apply to a definite NP, an intermediate step of definitivization is needed within the relative clause.

- (24) (a) The car struck a child that ran out into the street.  
 (b) The child ran out into the street.

Under this analysis, then, the shared NP of the constituent sentence either is definite in the deep structure, or becomes definite in the course of the derivation. Definitivization of the coreferential NP of the matrix sentence as proposed by Beverly Robbins (1963), on the other hand, can only be made optional or dependent upon presence of a constituent determiner uniqueness feature, as in Dean (1966), in view of contrasts like (25.a,b):

- (25) (a) The boy who lives next door is eight feet tall.  
 (b) A boy who lives next door is eight feet tall.

In (25.b) there is definitivization of the shared NP of the relative clause, but the matrix NP remains indefinite specific. With one class of nouns, however, the occurrence of the definite article is possible ONLY IF the NP has a relative clause:

- (26) (a) \*I prescribed the way/manner/place.  
 (b) I prescribed a [certain] way/manner/place in which she was to do it.  
 (c) She did it in the/a way/manner/place that I prescribed.

That is, the form the in (26.c) must be the result of definitivization on the basis of the following relative clause. This generalization appears to be correct for all non-pronominalizable nouns, an observation due to S.-Y. Kuroda (1968). See further discussion of this general topic in DET and PRO.

### c. Quantifiers

The quantifiers all/every/no can appear either in generic NP's or in non-generic ones. The sentences (9, 10, 11, 17, 21) are instances of these quantifiers in generic NP's, where the interpretations and constraints on relativization are like those of generic NP's in general. Sentences (27) are instances of these quantifiers in non-generic NP's, where as with the generics it is clear that the quantifier is not entailed in the shared NP of the relative clause:

- (27) (a) All the boys who left early missed the fun.  
 (b) [Not entailed] All the boys left early.  
 (c) Every boy who left early missed the fun.  
 (d) [Not entailed] Every boy left early.  
 (e) No boy who left early missed the fun.  
 (f) [Not entailed] No boy left early.

The sentences (27) do not differ on the surface from those of (9), (10), (11) except in tense; yet it is clear that the relevant NP's do not receive a generic interpretation in (27) but do in (9), (10), (11). Genericness, then, is somehow a sentence-level interpretation. That the sentences (27) are different (i.e. non-generic) from those of (9), (10), (11) is supported by the fact that the sentences (27) have no conditional sentence paraphrase. Quantifiers which cannot be interpreted as generic do, however, allow the interpretation that they are present in the shared NP of the relative clause:

- (28) (a) Both boys who left early missed the fun.  
 (b) Both boys left early.  
 (c) Several boys who left early missed the fun.  
 (d) Several boys left early.  
 (e) A few boys who left early missed the fun.  
 (f) A few boys left early.  
 (g) Many boys who left early missed the fun.  
 (h) Many boys left early.  
 (i) Some other boys who left early missed the fun.  
 (j) Some other boys left early.

The quantifiers of (27) cannot appear in the shared NP of the relative clause. A satisfactory solution of this problem in the NP-S analysis is not known at this time. Lakoff (1965) has suggested that these quantifiers must come from a higher sentence. Partee (1968) has argued against the Lakoff view.

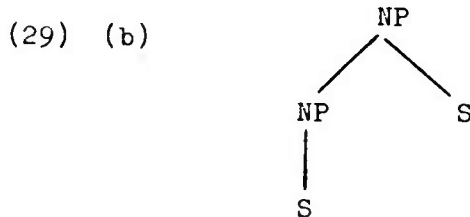
#### d. Nominalization

The NP-S analysis presents one special problem which it does not share with ART-S or NOM-S. As discussed in NOM and in GEN INTRO, relative clauses can never appear with true nominalizations

(i.e. gerundive, infinitival, and clausal nominalizations, as distinct from derived nominals like proposal, insistence, claim,...). True nominalizations have the structure



If the NP-S analysis of relative clauses is accepted, then structures like



will have to be blocked by some ad hoc condition. But under ART-S or NOM-S, no structure with a relative clause on a nominalization can be generated because of the disjunction, in the base rules, between S and either D NOM or D N as alternative expansions of NP.

The NP-S analysis, in sum, provides for stacking (to be discussed below), allows the identity condition of coreferentiality to be stated on the shared NP's provided that there is a process of definitivization available and provided that relativization on generics and on certain quantifiers are treated as different processes, the generic pseudo-relative deriving from conditional propositions. The other constraints needed are shared with both ART-S and NOM-S, and are discussed subsequently in this presentation, except for the special constraint against relative clauses with nominalizations, discussed under (d) above.

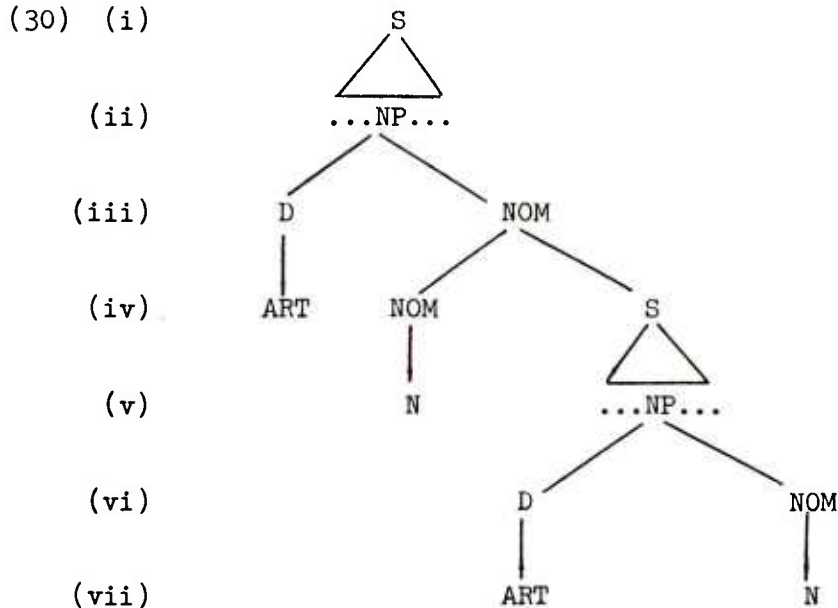
### C. The NOM-S Analysis

#### 1. Structure

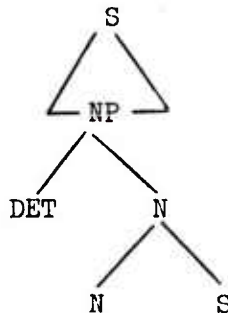
The analysis of the relative clause which was originally proposed by Paul Schachter and which was the basis for the relativization rule with which the grammar presented in UESP (1967) functioned is the NOM-S Analysis.



The NOM-S analysis has the P-Marker (30):



Janet Dean's (1967) analysis is very similar to the NOM-S analysis and has the basic form:

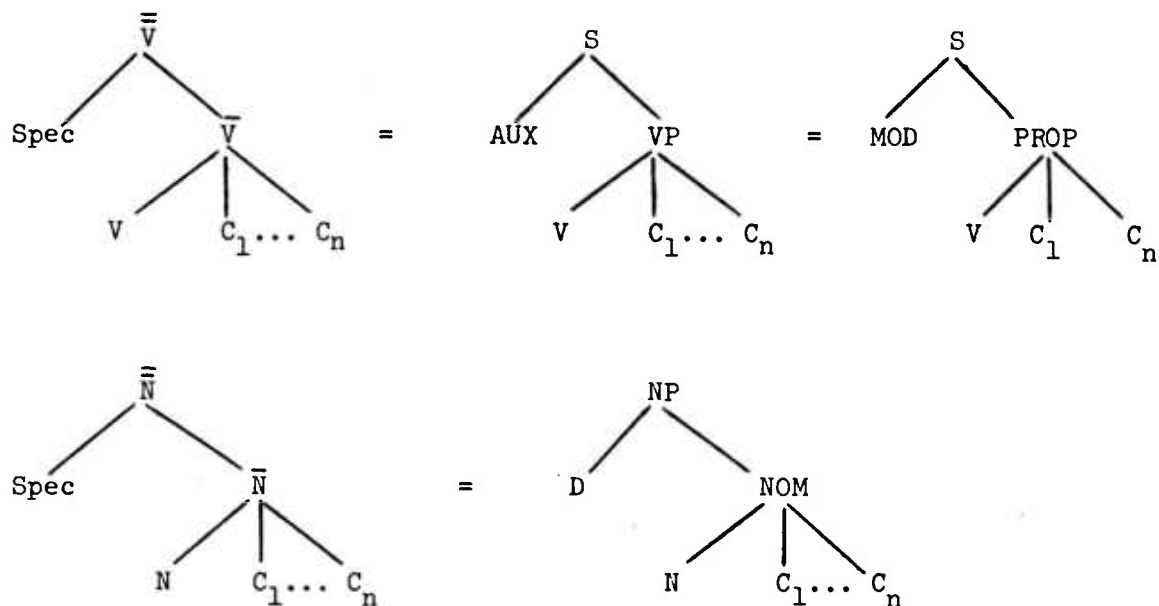


Her main argument for this structure is that relative clauses appear to modify the matrix noun, not the matrix NP as a whole, a point which she argues on the basis of entailment, much as in the NOM-S argument presented below. For example, sentences (31.a) and (32.a) would imply (31.b) and (32.b) respectively in the NP-S analysis.

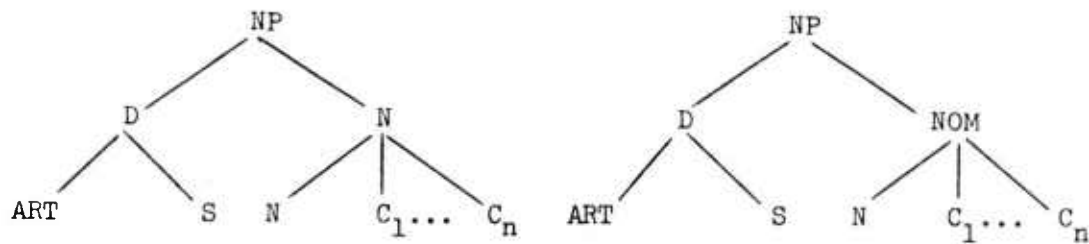
- (31) (a) Mary knows few boys who enjoy knitting.  
 (b) Mary knows few boys.
- (32) (a) Mary knows no boys who enjoy knitting.  
 (b) Mary knows no boys.

This argument can, of course, be interpreted as an argument against NP identity and/or including quantifiers in identity.

From the point of view of the Deep Case hypothesis, Dean's (1967) notation with N as a recursive symbol would create a problem. In order to maintain the X-Bar parallelism (see GEN INTRO), there needs to be one auxiliary symbol besides NP and N within the NP hierarchy:



To allow N to expand either to N + S (for the relative clause) or to N +  $C_1 \dots C_n$  (for the actants of N) would allow the possibility of expanding in either order, generating \*Some advocates who are particularly militant of that position demand annihilation, whereas in fact the REL must modify the head noun with all its cases: Some advocates of that position who are particularly militant demand annihilation. This additional symbol need not be NOM, of course - any convenient symbol would do as well. For relativization, on the NOM-S analysis, what is needed is some symbol below NP which includes all of NP except the determiner; for case grammar, what is needed is some symbol below NP which includes all of NP except the determiner but which is not the head noun with its associated cases. These two needs converge on NOM. Under the ART-S analysis, there is no independent need for NOM, and the structures diagramed above for NP could just as well be either of these:



Under the NOM-S proposal the ART of (30.vii) must be [-DEF, +SPEC, -WH]. Identity is required between the NOM of (30.vi) and the NOM of (30.iii). The question of coreferentiality is simply put aside under this analysis, since the identity condition is not met between shared NP's but only between NOM's. The motivations for the requirement of the indefinite [+SPEC] determiner are the following:

a. Relativization must be blocked on predicate nominals. Thus the sentences (33.b,d) are ungrammatical:

- (33) (a) That man is a lawyer  
 (b) \*The lawyer that that man is always leaves work early.  
 (c) The sun is the source of energy on earth.  
 (d) \*The source of energy on earth which the sun is cannot be inexhaustible.

Since NP's containing a determiner with the features [-DEF, +SPEC] cannot appear as predicate nominals in English, the assumption that relativization depends on the presence of these particular features explains in a natural way why relativization of indefinite predicate nominals is ungrammatical.

b. If relative clauses on generic NP's are assumed to be true relatives, not pseudo-relatives from conditional sentences as discussed above, then there is a natural explanation of the fact that the shared NP of the relative clause on a generic NP cannot be interpreted as generic. Thus the sentence (34.a) is in no way semantically anomalous, but the sentence (34.b) clearly contains an anomaly:

- (34) (a) Cats are mammals.  
 (b) Some cats are mammals.

Some cats, in (34.b), is taken as [-DEF, +SPEC]. Precisely the same anomaly is seen in (34.c):

- (34) (c) Cats which are mammals are dangerous.

The fact that the semantic anomaly of (34.b) is contained in the relative clause of (34.c) argues that the deep structure determiner of the relative clause should be assigned whatever features are appropriate to the determiner some in (34.b).

c. At least an interim solution to the problem of deriving relative clauses on both generic NP's and NP's containing quantifiers is provided by constraining the determiner to [-DEF, +SPEC].

- (35) (a) Some cats are mammals.  
 (b) Cats which are mammals are dangerous.  
 (c) Some/certain boys left early.  
 (d) All the boys who left early missed the fun.  
 (e) I think up some example.  
 (f) No example that I think up works right.

d. This constraint provides a natural account of the interpretation of proper nouns with determiners. (36.a) implies (36.b), not (36.c):

- (36) (a) I know a Mary Smith who plays bridge.  
 (b) A [certain - [+SPEC]] Mary Smith plays bridge.  
 (c) Mary Smith plays bridge.

In general, the NOM-S analysis resembles NP-S without the disadvantages of NP-S: the problem of relativization on nominalizations does not arise as it does with NP-S (see B.2.d above); and the problem of quantifiers with the identity condition for relativization is eliminated by the claim that there is only a single point at which the quantifiers are generated (the topmost determiner).

## 2. Problems

Arguing against motivations (b) and (c) above are the facts which relate generics to conditionals, in particular the fact that (37.a) cannot be said to entail (37.b):

- (37) (a) Any man who does that is a fool.  
 (b) Some man does that.

If the arguments for the pseudo-relative discussed under B.2.a above are solid, then the motivations C.1.a and C.1.b are spurious. (a) is still solid, and if the NOM-S analysis is to be rejected in favor either of ART-S or NP-S, then some other way of disallowing relativization on predicate nominals must be sought. One possibility is to show that the predicate nominal is really not an NP, because it lacks the full set of possibilities of expansion of other NP's. This remains an uninvestigated area for this paper, however.

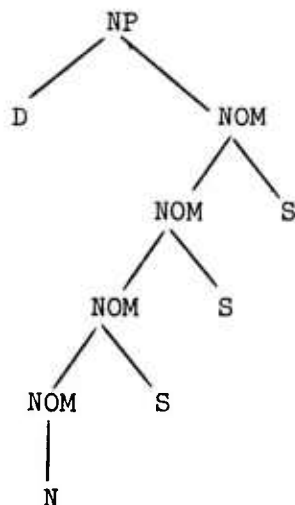
#### D. Deep-Structure Conjunction Analysis

It has also been proposed recently by several authors (Annear (1967), (1968a), (1968b), Brame (1968), and Postal (1967)) that relative clause sentences are, in the deep structure, conjoined sentences of some type. Unfortunately, these papers were received too late to do the analysis full justice in discussion, so that we presently can only bring the reader's attention to their existence. In any case, Annear (1968a) has rejected her earlier proposal to derive restrictive relatives directly from conjoined sentences: she now posits a more abstract structure like that proposed by Bach (1967a), which is the deep structure of conjunction also. This structure is a propositional logic of the form There exist 3x such that x equals boy, I know x, and x has a beard, underlying the sentence I know three boys who have beards. For this proposal, Annear rejects all stacking of relative clauses (see III below) and also assumes only indefinite articles in deep structure, with definitivization depending on linguistically external contextual information: i.e. definite articles depend on "the speaker's judgment of what the hearer knows, which varies with the situation" (Annear 1968a, MS p.7). Given our more conservative frame of reference, it is impossible to adopt her proposal directly, since we allow a choice between definite and indefinite in the determiner - a choice which in turn is no doubt governed by factors of the non-linguistic type she discusses.

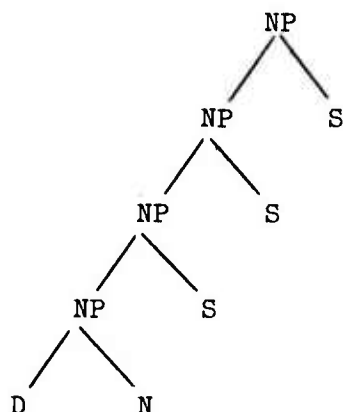
#### III. THE QUESTION OF STACKED RELATIVE CLAUSES

Relative clauses are said to be stacked if a structure exists such that the first clause modifies the head noun, the second modifies the head noun as already modified by the first clause, the third modifies the head noun as already modified by the first clause as in turn modified by the second clause, and so on. Recursion either on NP or on NOM (i.e. (12) or (1)) provides for such stacking, if we ignore for the moment the problem of stating identity conditions adequately:

(38) (a)



(b)



Prepositioned modifiers of nouns may be interpreted either as stacked or coordinate:

(39) (a) The Short Happy Life of Francis Macomber  
 [Stacked, but derived from non-restrictive structure: That part of his life which was happy, which was short.]

(b) That sure is a small large glass of milk.  
 ["For a large glass of milk, which is what I ordered, that sure is a small one."]



- (c) A good tall man always beats a good small man. [The stacked reading of this requires compound stress on TALL man and SMALL man.]
- (d) The short, happy life of Francis Macomber [coordinate]
- (e) She had a short, blue, cashmere coat. [coordinate]
- (f) Those ten square black Chinese paper boxes on the table are worth more than you think. [Stacked: boxes which are made of paper, which originated in China, which are black in color, which are square in shape, which are on the table." But note that it is impossible to provide an acceptable (or grammatical?) paraphrase with relative clauses that gives the stacked interpretation.]

When the stacking is in the normal post-nominal position of relative clauses, however, the differences of interpretation are not clear, and perhaps real differences between the internalized grammars of speakers of English must be postulated to explain the fact that stacking is for many speakers not an acceptable interpretation -- indeed, many claim that more than a single relative clause after a head noun, except by conjunction, is ungrammatical. The underlying relative clause structure of (39'.b) is a contradiction, though (39.b) is not:

(39') (b) \*A large glass of milk which is small...

Sandra Annear (1968a, Appendix) argues explicitly against our earlier view of stacking (UESP, 1967), claiming in particular that given two modifiers (either a sequence of postnominal relative clauses, or of prenominal adjectives), the one which is stressed (which in turn is governed by extra - linguistic factors, usually contrast with some alternative, stated or implied) is interpreted as of higher rank than the other one, regardless of order. There has not yet been sufficient discussion of her views to speak of any kind of convergence within the UESP research group; and in any case the group never achieved unanimity on the question of stacking.

In the clearest cases of what appears to be stacking, there are two possible head nouns to which the apparently stacked relative clauses can be related:

- (40) Those of the many men that died that were Americans were shipped back to the states.

(40) seems much more acceptable than (40'), a fact which requires some account that a stacking analysis cannot provide:

(40') Many men who died who were Americans were shipped back to the states.

For some speakers, (40') is ungrammatical without conjunction: ...who died and who were Americans... Similar disagreements occur even in respect to (41), which are examples that approach acceptability in dialects that generally find stacked relative clauses ungrammatical:

- (41) (a) I want to buy a watch that keeps good time that's cheap.
- (b) The colt that our stallion sired that grew up in Indiana won the Derby.
- (c) Any car that costs less than a hundred dollars that won't break down after a hundred miles would be a bargain.
- (d) The students who followed the march who evaded the police caused the trouble, though the ones that the police caught might have participated, had they had the chance.

The problem in interpreting (41) as stacked, distinct from conjoined, is that the reference of a noun restricted by two or more stacked relatives, and the reference of the same noun restricted by the same two relatives in a conjoined construction, would not be distinct. The claim of those who believe they have stacked relatives in their grammars is that although the reference is the same, the meaning is different. The claim of those who do not believe they have stacked relatives in their grammars is that the sentences of (39) are ungrammatical without conjunction, though perhaps derivatively possible by some kind of conjunction deletion. The non-stackers are then in the position of having to provide some alternative explanation of stacking of prepositioned nominal modifiers, which appear to be stackable, or at least interpretable as such, in all dialects.

Some of the more difficult examples that seem to compel a stacking analysis in an Aspects format eliminate themselves automatically in a case-grammar format. In particular, many examples like (42) need not contain stacked relative clauses at all, since phrases like by Henry James are agentives directly attached to the head noun in the deep structure, not reductions of relative clauses:

- (42) John read a book by Henry James that was very long and I read one that was very short.

For the non-stacking dialects, (42') is ungrammatical:

- (42') John read a book that was by Henry James that was very long and I read one that was very short.

Similarly (43) and (43'):

- (43) (a) Have you ever seen a car with rear engine drive that holds the road well?  
 (b) I want the pillow on the floor that has a torn edge.
- (43') (a) Have you ever seen a car that has rear engine drive that holds the road well?  
 (b) I want the pillow that's on the floor that has a torn edge.

Alternative explanations for the stacking of prenominal modifiers, for those speakers of English who do not have a rule of relative clause stacking in their grammars, may be suggested in several directions, though it appears that none of these are as straightforward as the solution that assumes deep-structure stacking as the source of prepositioned modifier stacking. There are some facts of English which seem to suggest that semantic interpretation depends partly on surface structure, in particular on placement of items like even, just (Kuroda, 1966a); it does not seem unreasonable to suggest that an interpretation of left-to-right stacking in an adjective sequence might also be such a surface phenomenon.

There are certain classes of examples which would suggest that stacking is necessary in the grammar even though some explanation would have to be sought for the fact that (40) is better than (40'), or the fact that many speakers reject strings of relative clauses with adjectival predicates even though the same adjectives in front of the head noun can receive a stacked interpretation. The first class of these is the superlative construction:

- (44) (a) The first book that I read that really amused me was Alice in Wonderland.  
 (b) The largest creature once common here which is now extinct is the brontosaurus.  
 (c) The most interesting proposal made by Fillmore that is now receiving significant attention is his case grammar proposal.

In such instances, it is reasonable to argue that the superlative itself, about which we know very little and of which no detailed analysis is presented in this grammar, has an embedded S that takes the form of a relative clause on the noun head modified by the superlative adjective. That is, the deeper structure of (44) is on the order of (44'):

- (44') (a) The first-that-I-read book that really amused me...
- (b) The largest-that-was-once-common-here creature which is now extinct...
- (c) The most-interesting-that-has-been-made-by-Fillmore proposal that is now receiving significant attention...

A second class of examples where it is the case that either stacking must be permitted by the grammar or some other explanation must be found may involve restrictions on conjunction reduction:

- (45) (a) A creature that was once common here and that is now extinct...
- (b) A creature once common here and now extinct...
- (c) A creature once common here that is now extinct...
- (d) ?A creature once common here and that is now extinct...

For a grammar without stacking, (45.c) is a problem to generate, since the underlying conjunction must be deleted, though it is generally the case for such dialects that the conjunction must be retained (thus all the examples of (41) are grammatical for such dialects if conjunctions are inserted between the relative clauses). This problem is not entirely clear, however, since for non-stacking dialects (45.d) is considerably better than (40') and certainly as good as (41); but it is worse than (45.c), so that some curious facts remain to be explained.

The third class of examples appears to consist of more or less absolute counter-examples to the non-stacking position. These are examples thought up by ingenious proponents of the stacking analysis which even the most recalcitrant opponents of that position find hard to deny:

- (46) Many people whom I spoke to in Biafra who had experienced the violence of the revolution nevertheless were reluctant to leave.

Except for the third class of counter-examples, it appears that stacking of relative clauses may be a fairly deep kind of basis for dialect differentiation, such that some speakers have the ART-S deep structure (which is easily constrained against stacking), where others have some sort of N-S structure (here the distinction between NP-S and NOM-S is of no consequence).



## IV. RELATIVE CLAUSES AND QUESTIONS

In Chomsky (1958) the relation of relative clauses to questions was accounted for by the fact that the interrogative transformation yielded yes/no questions, the WH- transformation yielded the relative clause constituent, and the application of both transformations resulted in WH- questions. Katz and Postal (1964b) adapted this analysis to the format presented in Integrated Theory by having WH act as a scope marker for Q in questions and generating both markers in the base. They made two further changes in Chomsky's analysis by attributing yes/no questions to a sentence with a WH attached to a sentence adverbial (so that all regular questions were WH questions) and by limiting the range of application of WH to the determiners of noun phrases (perhaps with the exception of the sentence adverbial of yes/no questions). Koutsoudas (1967) has argued that their positing of the same WH morpheme for questions and relative clauses is unjustified on any but morphological grounds and is therefore ad hoc, there being no apparent semantic equivalence of the two functions of the underlying WH. In addition, Koutsoudas pointed out difficulties in deriving both interrogative and relative pronouns from the same underlying source in the Katz and Postal analysis. Kuroda (1968) has also questioned the current treatment of the interrogative-relative relationship, since it appears to be motivated only by the fact that the common WH allows one to state WH- fronting for both interrogatives and relatives by a single rule and does not, according to him, account for the morphological identity of forms. While one might, in answer to Kuroda's criticism, reply that WH is one of a number of features which determine the morphological shape of both relative and interrogative pronouns, and that if certain of these feature complexes are identical in the surface structure, the same phonological form results, such an explanation is at best rather superficial. For interrogatives (see INTERROG) we posit an underlying WH attached to the "questioned" element(s) and no Q; for relative clauses, we do not postulate an underlying WH, but rather introduce it by transformation, so that on a deep level, we do not relate questions to relative clauses, and we must therefore claim the similarity to be one of a superficial nature. This analysis is based on relatively independent investigation of the two phenomena, and is therefore independently motivated by the facts of the two analyses, such as WH- fronting and second lexical look-up. Ross (1967c) also regards the relative and interrogative rules as quite unrelated, attributing the similarities between the constraints to which they are subject to the fact that both move constituent across variables. As Zwicky (1968) has pointed out, however, this fails to account for morphological similarities between the resulting WH- words. This criticism can equally well be applied to our analysis.

## V. PROPER NOUNS AND UNIQUE REFERENCE

A fact about relativization noted by virtually all investigators is that restrictive relative clauses cannot occur with proper nouns (provided, at least, that the proper noun has no determiner). At one point in the history of our own study of relativization we proposed to explain this fact by the assumption of some determiner other than a definite one on the coreferential NP of the relative clause -- e.g., as above, the [-DEF, +SPEC] determiner. Since we assumed that all proper nouns had a zero form of the definite determiner, the requirement of [-DEF, +SPEC] in the coreferential noun automatically excluded relativization on proper nouns. However, some scholars (e.g. Postal at the Second UCSD Conference on English Syntax, and Sloat (1968)) have argued that the only fact that singles out proper nouns is that the definite article is zeroed out if there is no relative clause, so that (47.a) has the surface structure (47.b), but (47.c,d) are fully grammatical and comparable to such constructions with common nouns:

- (47) (a) \*The Alice is a pleasant girl.  
 (b) Alice is a pleasant girl.  
 (c) The Alice I like best is the fat one.  
 (d) An Alice whom I would like to meet lives just down the street.

The problem is uniqueness of reference: the NP that cannot be relativized on is any NP of which the referent is unique; if the NP has several possible referents, relativization is possible; if the NP is one which is normally understood to have unique reference but is being used with multiple reference, relativization is not only possible but necessary, as in (47.c,d); and finally if the NP is one which cannot be interpreted to have unique reference, then relativization is obligatory.

- (48) (a) UNIQUE:  
 The sun, which is millions of miles away,  
 is the source of all energy on earth.  
 \*The sun which is millions of miles away  
 is the source of all energy on earth.  
 (b) NORMALLY UNIQUE BUT USED WITH MULTIPLE REFERENCE:  
 A sun which is millions of miles away is the  
 source of all energy on earth.  
 \*A sun is the source of all energy on earth.  
 (c) UNIQUE REFERENCE IMPOSSIBLE:  
 Any sun which is a million miles away is the  
 source of all energy on earth.  
 \*Any sun is the source of all energy on earth.



The same generalization holds for proper nouns. In (47.b) Alice has unique reference (in the mind of the speaker, at any rate). In (47.c) and (47.d) clearly there are several referents to whom the name Alice refers, and the relative clause sorts them out.

But notions like "unique reference" and "normally unique but used with multiple reference" are not themselves syntactic notions. All the syntax can reasonably do is provide for the various grammatical possibilities of (47) and (48) and leave it to some sort of interpretive/semantic component to guarantee that these notions, which clearly play a role in interpretation, will be sorted out there. We assume, therefore, only a rule which deletes a determiner from in front of a proper noun if that proper noun is not modified by a relative clause; otherwise, the rules apply equally to all classes of nouns.

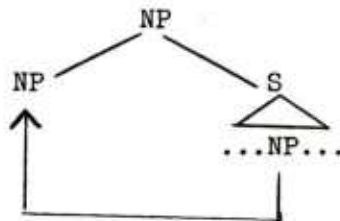
From this point on until the rules themselves, the trees drawn for illustrative purposes, and deep structures referred to, are based on the NP-S analysis, since the general constraints which Ross has discussed most fully can be so formulated as to hold equally well for ART-S, NOM-S, or NP-S.

## VI. GENERAL CONSTRAINTS

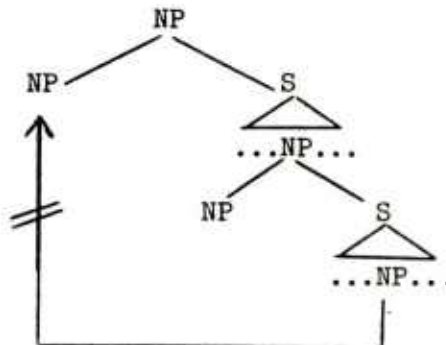
### A. Complex NP Constraint

The configuration (47.a) requires relativization, given a coreferential NOM (or NP), but the configuration (47.b) does not permit it:

(49) (a)



(b)



Thus from sentences (50.a) the grammar must not derive (50.b):

(50) (a) Ruth liked the sketch S

The critic detested the artist S

The artist drew the sketch

(b) \*Ruth liked the sketch that the critic detested the artist who drew.

Chomsky (1964a) accounted for the ill-formedness of sentences like (50.b) by the A-over-A principle, but this principle turns out to be too powerful, blocking the enumeration of several classes of well-formed sentences. It is possible to formulate a special condition on the relativization rule itself to block sentences like (50.b), but such a solution [utilized in UESP (1967)] is not only ad hoc but it fails to account for similar restrictions on the fronting of nominals in the interrogative construction. Ross (1967c) sets forth the COMPLEX NP CONSTRAINT which effectively blocks not only (50.b) but also certain other classes of ill-formed relativizations, in particular relativizations from fact-S discussed below. Ross's condition states:

- (51) No element contained in a sentence dominated by a noun phrase with a lexical head noun may be moved out of that noun phrase by a transformation. [(4.20)]

Thus it permits (49.a) but not (49.b). Similarly coreferential nouns within fact-S constructions are blocked from relativization (as long as the head noun fact is still present):

- (52) (a) I believed the claim that Otto was wearing the hat. [Ross (4.17.a)]  
 (b) \*The hat which I believed the claim that Otto was wearing is red. [Ross (4.18.a)]  
 (c) The evidence that Nick committed the murder was inconclusive.  
 (d) \*The murder which the evidence that Nick committed was inconclusive horrified the public.

The Complex NP Constraint says nothing about the movement of NP's outside of S's dominated by NP's whose daughters do not include lexical head nouns. Thus the relativizable noun may be found in some -- perhaps quite deeply embedded -- sentential complement on a verb, noun, or adjective, as in (53):

- (53) (a) A man expected a boy to persuade a girl to consider an Englishman intelligent.
- (b) I knew the man who expected a boy to persuade a girl to consider an Englishman intelligent.
- (c) I know the boy whom a man expected to persuade a girl to consider an Englishman intelligent.
- (d) I knew the girl whom a man expected a boy to persuade to consider an Englishman intelligent.
- (e) I knew the Englishman whom a man expected a boy to persuade a girl to consider intelligent.

But if the configuration out of which the relativizable noun is moved is a noun clause of the form that-S, the possibility of movement of NP's out of it is not unrestricted. Provided that the noun clause is an object, the only two constraints have to do with whether the noun is the surface subject immediately after the complementizer that, as in (52.b), and with whether the noun is a dative, in which case there is a British/American dialect split, as in (54.a):

- (54) (a) The dean assumed that the chairman had sent the information to the students.
- (b) \*The chairman whom the dean assumed that had sent the information to the students was at a loss.
- (c) \*The students whom the dean assumed that the chairman had sent the information were at a loss. [OK for British]
- (d) The students whom the dean assumed that the chairman had sent the information to were at a loss.
- (e) The students to whom the dean assumed that the chairman had sent the information were at a loss.
- (f) The information that the dean assumed that the chairman had sent to the students was incorrect.

(54.c) indicates that the DATIVE MOVEMENT RULE (Which deletes to and places the indirect object in front of the direct object) cannot precede relativization in American English, though it can in British. But the DATIVE MOVEMENT RULE is in the lower cycle, so that it is not clear how to block (54.c) except by an ad hoc exclusion. (54.b), in conjunction with (54.b') indicates that NP's in subject position cannot be moved out of the object noun clause while the complementizer that is present, though they may in its absence:

- (54) (b') The chairman whom the dean assumed had sent the information to the students was at a loss.

This constraint is entirely a matter of surface subject, since either the active subject or the passive subject is unrelativizable if the complementizer is present:

- (55) (g) The dean assumed that the information had been sent to the students by the chairman.  
 (h) \*The information which the dean assumed that had been sent to the students by the chairman was incorrect.  
 (i) The dean assumed that the students had been sent the information by the chairman.  
 (j) \*The students whom the dean assumed that had been sent the information by the chairman were at a loss.

From this evidence it appears clear that there is no very deep fact involved in the blocking of relativization of subject NP's preceded by that in object noun clauses: that is a complementizer which should not appear in the deep structure at all, but rather be introduced somewhere along the line in the transformational derivation of nominalized object clauses -- in order to guarantee that it will not block relativization in sentences like (54.b') we need to provide only that the rule of that-deletion has applied prior to relativization on the subject of a nominalized clause. Since that-deletion is in the lower cycle (i.e. the cycle below the one on which relativization takes place), rule-ordering is irrelevant to the solution. The solution depends rather on a condition in the relativization rule itself, namely that there be no item that preceding the coreferential NP which is moved by relativization.

There is one consideration which creates a problem with this quite general and appealing solution: there is a class of verbs with which that-insertion is obligatory. These verbs, pointed out by Janet Dean, include rejoice, quip, snort,...

- (55) (a) We rejoiced that the students found the solution.  
 (b) \*We rejoiced the students found the solution.

Given such verbs, the subject of the sentential object cannot provide the basis for relativization:

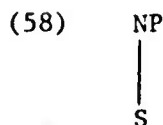
- (56) (a) \*The students that we rejoiced that found the solution were tired.  
 (b) \*The students that we rejoiced found the solution were tired.

But for some speakers, at least, none of the NP's of such clauses are relativizable:

- (57) (a) \*The solution that we rejoiced that the students found was untenable.  
 (b) \*The solution that we rejoiced the students found was untenable.  
 (c) He snorted that the police ought to arrest the demonstrators.  
 (d) \*The demonstrators that he snorted that the police ought to arrest were causing great damage.  
 (e) He quipped that he would reject the solution if he had a better one.  
 (f) \*The solution that he quipped that he would reject if he had a better one was unassailable.

If it is a fact that no subject NP can be moved out of a that-S construction, then the solution proposed above can be maintained by the ad hoc device of inserting the that-complementizer with the verbs that require it, and providing a general condition (not specific to relativization) that no NP can be moved out of such clauses. For the usual case, where that is not present in the deep structure, such a condition would not apply.

We have considered above the restriction on noun clauses when they are objects: in the light of the proposals above, we limit such structures, as deep structures with the complementizer inserted by the verb, to the verbs rejoice, quip, snort,...; all other surface structures of the that-S type are in fact of the type (58).



For the moment we provide no deeper analysis of the verbs rejoice, quip, snort... though it is clear that the peculiarity of their behavior with respect to relativization from within their sentential objects may have a deeper account: e.g. (55.a) may be derived from (55.a'):

- (55) (a') We rejoiced in the fact that the students found the solution.

If this is correct, the Complex NP Constraint would automatically block relativization on NP's within the sentential complement of fact. But quip and snort have a rather different deeper analysis: He made the quip that..., He gave a snort that... Both of these would also block automatically, since the that-S is dominated by a lexical head noun. So under either this deeper analysis of the non-conforming verbs, or under the proposal that the that-complementizer is part of the deep structure with just these verbs, the general solution of relativization appears to hold.

#### B. Sentential Subject Constraint

Now consider the restrictions on movement of NP's out of structures like (58) when the noun clause is a subject:

- (59) (a) That the chairman had sent the information to the students was assumed by the dean.  
 (b) \*The students whom that the chairman had sent the information to was assumed by the dean...  
 (c) \*The students to whom that the chairman had sent the information was assumed by the dean...  
 (d) \*The information which that the chairman had sent to the students was assumed by the dean was incorrect...  
 (e) \*The chairman who that had sent the information to the students was assumed by the dean was at a loss...

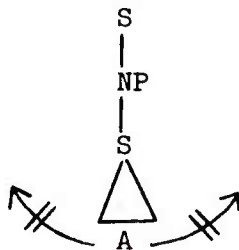


(59.a) is the passive form of (54.a), but this fact is irrelevant to what is going on in (59), since the same constraints will apply to any sentential subject (though after extraposition, the constraint does not apply):

- (60) (a) That the chairman had sent the information to the students annoyed the dean.  
 (b) \*The information which that the chairman had sent to the students annoyed the dean was incorrect.  
 (c) The information which it annoyed the dean that the chairman had sent to the students was incorrect.  
 (d) That she committed the murder was obvious.  
 (e) \*The murder which that she committed was obvious was a heinous crime.  
 (f) The murder which it was obvious that she committed was a heinous crime.

(60.b) and (60.e) are blocked by Ross's SENTENTIAL SUBJECT CONSTRAINT:

- (61) No element dominated by an S may be moved out of that S if that node S is dominated by an NP which itself is immediately dominated by S. [(4.254)]



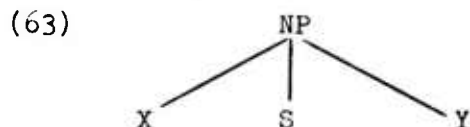
A peculiarity of sentences to which the sentential subject constraint applies is that relativization is not possible even on an NP in the object if the subject is sentential unless there is extraposition of the sentential subject:

- (62) (a) That the girl wanted to depart early annoyed the boy.  
 (b) \*The boy whom that the girl wanted to depart early annoyed was dull.  
 (c) It annoyed the boy that the girl wanted to depart early.  
 (d) The boy whom it annoyed that the girl wanted to depart early was dull.

To block sentences like (62.b) Ross has an output condition:

Grammatical sentences containing an internal NP which exhaustively dominates S are unacceptable.

That is, given (63):



where neither X nor Y is null, the sentence containing this configuration is unacceptable, though grammatical. It might be noted in passing that precisely this condition would serve to mark the unacceptability of the sentences like (3) under the ART-S analysis.

Sentences like (60.c), (60.f), and (62.d), where clearly extraposition must precede relativization, were analyzed in just this way (i.e. extrapose and then relativize) by Ross (1966b) though he appears to contradict this analysis in his dissertation when he argues that extraposition must be last-cyclic.

### C. Coordinate Structure Constraint

A third general condition must be used to block relativization on a single conjunct in a coordinate construction (the examples (64) are Ross's):

- (64) (a) Henry plays the lute and sings madrigals. [(4.80)]  
 (b) \*The lute which Henry plays and sings madrigals is warped. [(4.82.a)]  
 (c) \*The madrigals which Henry plays the lute and sings sound lousy. [(4.82.b)]

These are blocked by Ross's COORDINATE STRUCTURE CONSTRAINT:

- (65) In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct. [(4.84)]

A general class of exceptions to this constraint, not relevant to the problem of relativization, is rule schemata which move a constituent out of all the conjuncts of a coordinate structure (i.e. conjunction reduction, in general).

## D. Pied Piping

## 1. Ross's Constraints

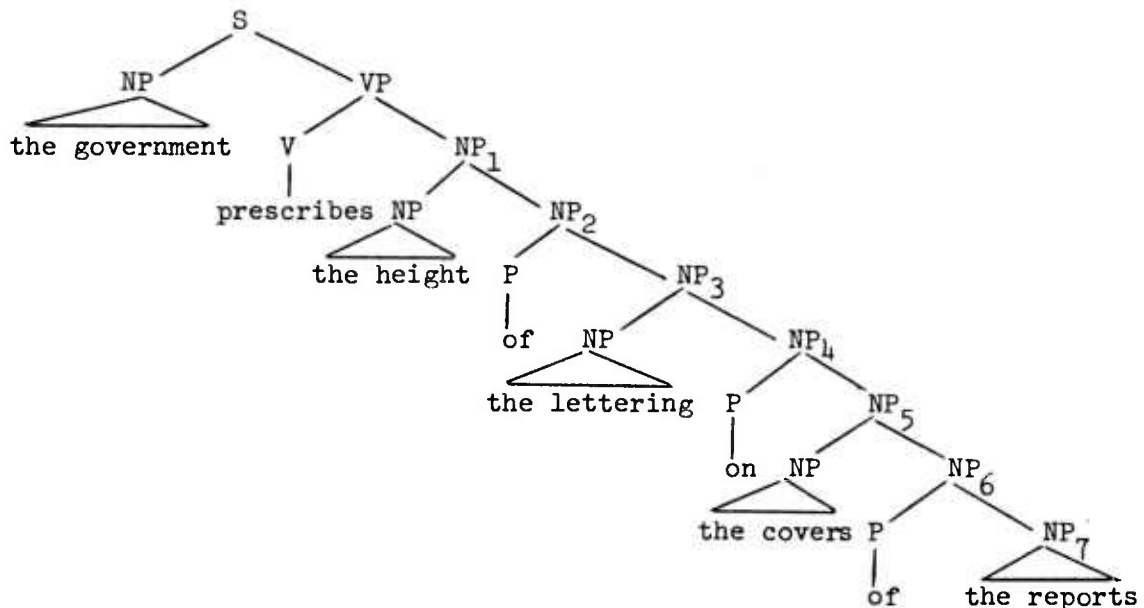
The final condition on relativization is called PIED PIPING by Ross, a condition enormously more complex and less general than the three conditions (COMPLEX NP, SENTENTIAL SUBJECT, AND COORDINATE STRUCTURE) noted so far.

Pied Piping is a convention intended to guarantee that certain NP's which dominate a coreferential NP can be moved along with the coreferential NP when it is moved by relativization. The convention as formulated by Ross has a moderately incredible set of conditions imposed upon it to make it work satisfactorily; and even the initial tree which is subject to Pied Piping is highly suspect in Ross's version of it, containing prepositional phrases dominated by NP. It is hard to imagine the rules which would produce such trees, outside of a case grammar of a type which Ross does not claim to be invoking. But given the case-grammar framework of the present analysis, Ross's trees can be made plausible and a number of his special conditions on the Pied Piping convention can either be eliminated or stated more effectively. The sentences (67), all relativizations on reports in (66), illustrate the problem [all from Ross (1967c), 197ff.].

- (66) The government prescribes the height of the lettering on the covers of the reports.
- (67) (a) Reports which the government prescribes the height of the lettering on the covers of are invariably boring.
- (b) \*Reports of which the government prescribes the height of the lettering on the covers are invariably boring.
- (c) Reports the covers of which the government prescribes the height of the lettering on almost always put me to sleep.
- (d) \*Reports on the covers of which the government prescribes the height of the lettering almost always put me to sleep.
- (e) Reports the lettering on the covers of which the government prescribes the height of are a shocking waste of public funds.
- (f) \*Reports of the lettering on the covers of which the government prescribes the height are a shocking waste of public funds.
- (g) Reports the height of the lettering on the covers of which the government prescribes should be abolished.

The tree Ross provides for (66) is (67'):

(67')



Ross notes (p. 201) that there seems to be a constraint, in his dialect at least, which prohibits noun phrases which start with prepositions from being relativized (and questioned) when these directly follow the NP they modify (see (67.b,d,f)). Ross (p. 201) does not attempt a precise formulation of this constraint on Pied Piping, but instead discusses other constraints that the convention requires. From the limited investigation we have done, it appears that these other constraints are essentially correct, and therefore we only discuss them briefly, before returning to the question of piping a PREP-NP in a NP-PREP-NP construction and some related issues.

The first condition that blocks Pied Piping is the coordinate structure constraint, discussed above. The second is a condition special to Pied Piping which blocks its occurrence across an intervening S node, as in (68): [Ross's examples]

- (68) (a) They will give me a hat which I know that  
I won't like.  
(b) \*They will give me a hat that I won't like  
which I know.

A third condition is the LEFT BRANCH CONDITION, where Pied Piping is obligatory: [Ross's examples]

- (69) (a) We elected the boy's guardian's employer president.  
 (b) The boy whose guardian's employer we elected president ratted on us.  
 (c) \*The boy whose guardian's we elected employer president ratted on us.  
 (d) \*The boy whose we elected guardian's employer president ratted on us.

A fourth condition prevents a head noun which is not pronominalizable from moving out of a prepositional phrase: [Ross's examples]

- (70) (a) \*What time did you arrive at?  
 (b) \*The manner which Jack disappeared in was crazy.  
 (c) \*The place which I live at is the place where Route 150 crosses Scrak River.

A fifth condition is the IDIOMATIC PREP-PHRASE condition, where Pied Piping is not permitted, involving idiomatic phrases like do away with, get wind of, get one's sights on, etc., to block the likes of (71):

- (71) (a) \*She's the girl with whom he did away.  
 (b) \*That's the answer of which he got wind.  
 (c) \*That the deer on which he got his sights.

We now turn to aspects of Pied Piping about which there is more question, and in particular the question of the conditions under which PREP-NP can or must move the PREP along with the NP.

## 2. Case Movement Constraint

The aspects of piping investigated here center around three issues:

- (a) how necessary is Ross's tentative constraint disallowing noun phrases which start with prepositions from being relativized (or questioned) when these directly follow the noun phrase they modify? (67.b,d,f)  
 (b) what constraints are necessary on  $\text{PREP}^{\sim}\text{NP}$  piping in  $\text{NP}^{\sim}\text{PREP}^{\sim}\text{NP}$  constructions?  
 (c) is piping possible on co-referential NP's resulting from REL-BE deletion?

(a) How necessary is the constraint on piping the PREP with the NP in a NP<sup>PREP</sup>NP construction?

Informant response to sentences containing this kind of PREP fronting is extremely varied. In general sentences (72) and (73) are considered valid counterexamples to Ross's constraint since they are evidence that the modifying PREP can front with its co-referential NP.

- (72) (a) The solutions to the problems were ingenious.
- (b) The problems which the solutions to were ingenious were trivial.
- (c) The problems to which the solutions were ingenious were trivial.
- (73) (a) The answers to the questions were brief.
- (b) The questions which the answers to were brief were long.
- (c) The questions to which the answers were brief were long.

Native speakers who accept (72.c) and (73.c) will frequently have different responses to (72.b) and (73.b). The responses range roughly from outright rejection through grudging acceptance to complete acceptance. The same speakers who accepted (72.c) and (73.c) will however reject (74.c) and (75.c) and have mixed reactions to (74.b) and (75.b).

- (74) (a) The bottom of the barrel was bloodstained.
- (b) The barrel which the bottom of was bloodstained had once held malmsey.
- (c) The barrel of which the bottom was bloodstained had once held malmsey.
- (75) (a) The goal of the course was clear.
- (b) The course which the goal of was clear was well organized.
- (c) The course of which the goal was clear was well organized.

All the native speakers questioned, it should be noted, accept the (c) sentences as non-restrictive relative constructions. Confronted with these extremely varied responses, we have taken the following position: we claim that if the PREP<sup>NP</sup> in a NP<sup>PREP</sup>NP construction can be piped, then either the co-referential NP alone, or that NP plus the PREP, or that NP plus the PREP plus the NP with which it is in construction can all be piped. Thus we accept as grammatical all the (b) and (c) sentences of (72-75), and furthermore allow the following (d) sentences of (72-75):



- (72) (d) The problems the solutions to which were ingenious were trivial.
- (73) (d) The questions the answers to which were brief were long.
- (74) (d) The barrel the bottom of which was bloodstained has once held malmsey.
- (75) (d) The course the goal of which was clear was well organized.

A consequence of this position is that we disagree with Ross's stars on (67.b,d,f) and instead hold that all the sentences of (67) are grammatical. In fact none of the longer instances of piping are stylistically pleasing, but we find (67.e), which Ross accepts, stylistically as inept as (67.f), which he disallows. It is conceivable that the length of the piping is critical in determining the possibility of PREP fronting, but there is evidence that suggests that that is not the crucial factor. Consider the consequences of piping on the NP<sup>^</sup>PREP<sup>^</sup>NP constructions of (72.a) and (73.a) when they occur not in subject but in object position and therefore must pipe over the verb.

- (76) (a) He checked the solutions to the problems.  
 (b) The problems which he checked the solutions to were ingenious.  
 (c) The problems to which he checked the solutions were ingenious.
- (77) (a) He checked the answers to the questions.  
 (b) The questions which he checked the answers to were clear.  
 (c) The questions to which he checked the answers were clear.

Of the native speakers who accepted (72.c) and (73.c), some reject (76.c) but allow (77.c). The piping distance will not account for these differences in response. Perhaps further investigation will show that PREP piping is related to a more subtle analysis (see below) of types of NP<sup>^</sup>PREP<sup>^</sup>NP construction.

Finally a consequence of taking the position that where the NP can pipe, the PREP, and its related items, can follow, is that we offer no account of the diversity of native speaker response: another problem to be stuffed into the black output conditions box.

(b) What constraints are necessary on  $\text{PREP} \sim \text{NP}$  piping in  $\text{NP} \sim \text{PREP} \sim \text{NP}$  constructions?

Ross, in his concern with other conditions on piping, does not differentiate between distinct types of  $\text{PREP} \sim \text{NP}$ . Our position is that there are such constraints and that they can be more simply handled in a grammar that distinguishes the various case relations of the  $\text{PREP} \sim \text{NP}$  to the NP it is in construction with. Not all case relations have yet been determined, but the following hypothesis holds reasonably well in the grammar as it now stands:

in general, all cases in construction can pipe except for AGENT, LOCATIVE AND DATIVE.

As evidence that AGENT in construction with an NP cannot pipe, consider (78) and (79):

- (78) (a) The book by the professor was turgid.
- (b) \*The professor who the book by was turgid was unhappy.
- (c) \*The professor by whom the book was turgid was unhappy.
- (d) \*The professor the book by whom was turgid was unhappy.
- (79) (a) The Army edited the analysis of the report by the professor.
- (b) \*The professor who the Army edited the analysis of the report by was indignant.
- (c) \*The professor by whom the Army edited the analysis of the report was indignant.
- (d) \*The professor the analysis of the report by whom the Army edited was indignant.

As evidence that LOC in construction with an NP cannot pipe, consider (80) and (81):

- (80) (a) The workers in the mines were underpaid.
- (b) \*The mines which the workers in were underpaid were nationalized.
- (c) \*The mines in which the workers were underpaid were nationalized. [Acceptable only in the sense "The workers were underpaid in those mines"]
- (d) \*The mines the workers in which were underpaid were nationalized.

- (81) (a) The dishes in the sink were dirty.  
 (b) \*The sink which the dishes in were dirty was cracked.  
 (c) \*The sink in which the dishes were dirty was cracked.  
 (d) \*The sink the dishes in which were dirty was cracked.

As evidence that DAT in construction with an NP cannot pipe, consider (82):

- (82) (a) The gift to the chairman was trite.  
 (b) \*The chairman who the gift to was trite was sad.  
 (c) \*The chairman to whom the gift was trite was sad.  
 (d) \*The chairman the gift to whom was trite was sad.

(82.c) is grammatical, but only with a different semantic reading from the reading appropriate to (82.a). Note that DAT, when not in construction with an NP, allows PREP fronting.

- (83) (a) He sent the gift to the secretary.  
 (b) The secretary who he sent the gift to was delighted.  
 (c) The secretary to whom he sent the gift was delighted.

(84) is evidence that DAT is not in construction with the NP, but with the VP:

- (84) \*The secretary the gift to whom he sent was delighted.

We conclude this section with some examples of cases in construction with NP's that our rules would allow. We claim that (85) - (88) are grammatical.

- (85) (a) She detested the author of the book.  
 (b) The book which she detested the author of was a best-seller.  
 (c) The book of which she detested the author was a best-seller.  
 (d) The book the author of which she detested was a best-seller.
- (86) (a) The winner of the prize was a Navaho.  
 (b) The prize which the winner of was a Navaho was a trip to New Mexico.  
 (c) The prize of which the winner was a Navaho was a trip to New Mexico.  
 (d) The prize the winner of which was a Navaho was a trip to New Mexico.

- (87) (a) The notice about the reward was illegible.  
 (b) The reward which the notice about was illegible was over \$1,000.  
 (c) The reward about which the notice was illegible was over \$1,000.  
 (d) The reward the notice about which was illegible was over \$1,000.
- (88) (a) His anguish over the crimes was inordinate.  
 (b) The crimes which his anguish over was inordinate were certainly gruesome.  
 (c) The crimes over which his anguish was inordinate were certainly gruesome.  
 (d) The crimes his anguish over which was inordinate were certainly gruesome.

Note that if the possessive in (88) had been on any NP in the construction except the first, piping is ruled out.

- (89) \*His crimes which the anguish over was inordinate were certainly gruesome.

(c) Is piping possible on coreferential NP's resulting from REL-BE deletion?

We assume that the distinction Chomsky made (1968) between an NP<sup>^</sup>PREP<sup>^</sup>NP construction, such as a house in the woods, and a reduced relative, such as that book on the table, is correct; Chomsky's evidence for the distinction was in part the narrow restrictions on the head noun in the NP<sup>^</sup>PREP<sup>^</sup>NP constructions, and in part the possibility of contrastive stress for the NP<sup>^</sup>PREP<sup>^</sup>NP construction: -- JOHN'S house in the woods --, but the impossibility of an analogous contrastive stress for the reduced relative: -- \*JOHN'S book on the table. The very fact that a preposed possessive is possible with house in the woods demonstrates that it must be derived, on one reading, from a case-source rather than a reduced-relative-clause source, since preposed possessives are ungrammatical with relative clauses: \*John's house that is in the woods, \*John's book that is on the table.

Since the reduced relative construction can be similar superficially in its bracketing to an NP<sup>^</sup>PREP<sup>^</sup>NP construction, the question arises of its behavior with respect to piping. Our position is that it is not possible to relativize on the second NP of a reduced relative construction. Thus we claim that the sentences of (80) could not be derived from the reduced form of (90) any more than the sentences of (91) could be derived from (92).

(90) The workers (who were) in the mines were underpaid.

↓  
∅

(91) (a) \*The evening  $\left\{ \begin{array}{l} \text{which} \\ \text{in which} \end{array} \right\}$  the party  $\left\{ \begin{array}{l} \text{in} \\ \emptyset \end{array} \right\}$   
was dull was windy.

(b) \*The hotel  $\left\{ \begin{array}{l} \text{which} \\ \text{at which} \end{array} \right\}$  the party  $\left\{ \begin{array}{l} \text{at} \\ \emptyset \end{array} \right\}$   
was dull was large.

(92) (a) The party (that was) in the evening was dull.

↓  
∅

(b) The party (that was) at the hotel was large.

↓  
∅

In other words we hold that predicate LOC and TIME phrases, like predicate NOMINAL phrases, cannot undergo relativization. To disallow (91) the relative formation rule must be blocked from applying to the output of the REL-BE deletion rule.

## VII. REDUCED RELATIVES AND CASES ON NOUNS

An additional question concerning REL-BE deletion is the fact that by way of REL-BE deletion, we can generate such sentences as (94) from (93):

(93) The boy who is from Chicago hit me.

(94) The boy from Chicago hit me.

while at the same time, our case-grammar framework provides structures for such expressions as (95), (96), and (97):

(95) the back of the room...

(96) the author of the book...

(97) the introduction of output conditions...

as cases on nouns, obviously not the result of REL-BE deletion.

The problem is, of course, to be able to tell one type from the other, and, more seriously, to avoid, in a well-motivated way, predicting false ambiguities by generating the same result by both relative clause reduction and cases on nouns where there is no such ambiguity. There appear to be some examples of genuine ambiguity, such as (98):

(98) our agent in Chicago...

where one may be referring to the Chicago agent (a Locative on agent) or an agent who is in Chicago, but normally there is no such ambiguity.

It has been suggested that if a frequency adverb can be inserted after the head noun of the structures in question, then the structure in question is derived via a relative clause, since, presumably such adverbs are of sentential origin. However since we know so little about adverbs in general and frequency adverbs in particular, the validity of this test is open to question. It yields results such as (99) and (100):

(99) the books usually on the table...

(100) \*the key usually to the door...

In addition, it is quite often unclear whether or not a given expression has passed the test. Besides, this test would, if it worked, only allow us to determine the constituency after the fact when what is needed is a principled means of generating only the correct structures.

At this time we can only point out the difficulty, realizing that if it cannot be handled in a principled way within case grammar and if it can be so handled in some other format, then this would constitute a strong argument against this aspect of our analysis and case grammar in general, since it is the case structure which leads to this particular representation of this dilemma, but provides no explanation for it.

#### VIII. WH- ATTACHMENT AND FRONTING

If WH- attachment and WH- fronting are handled by two separate rules, as has generally been assumed (e.g. in Smith, 1964), it is possible to regard dialects in which (101) - (104) are acceptable as having made the fronting rule optional.

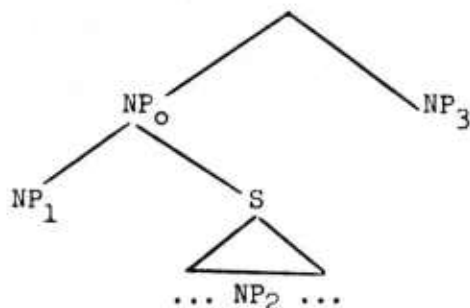


- (101) This is a book before I had read which I was benighted.
- (102) This is a book the man who wrote which is a fool.
- (103) The hat I believed the claim that Otto was wearing which is red [on the non-appositive reading].
- (104) Ruth liked the sketch the artist who drew which was detested by the critics.

It is not totally clear whether Ross's complex NP Constraint should apply to WH- attachment. If it applies, it would block (101) - (104). The assumption that it might apply to WH- attachment follows from the following two claims of Ross (1967c):

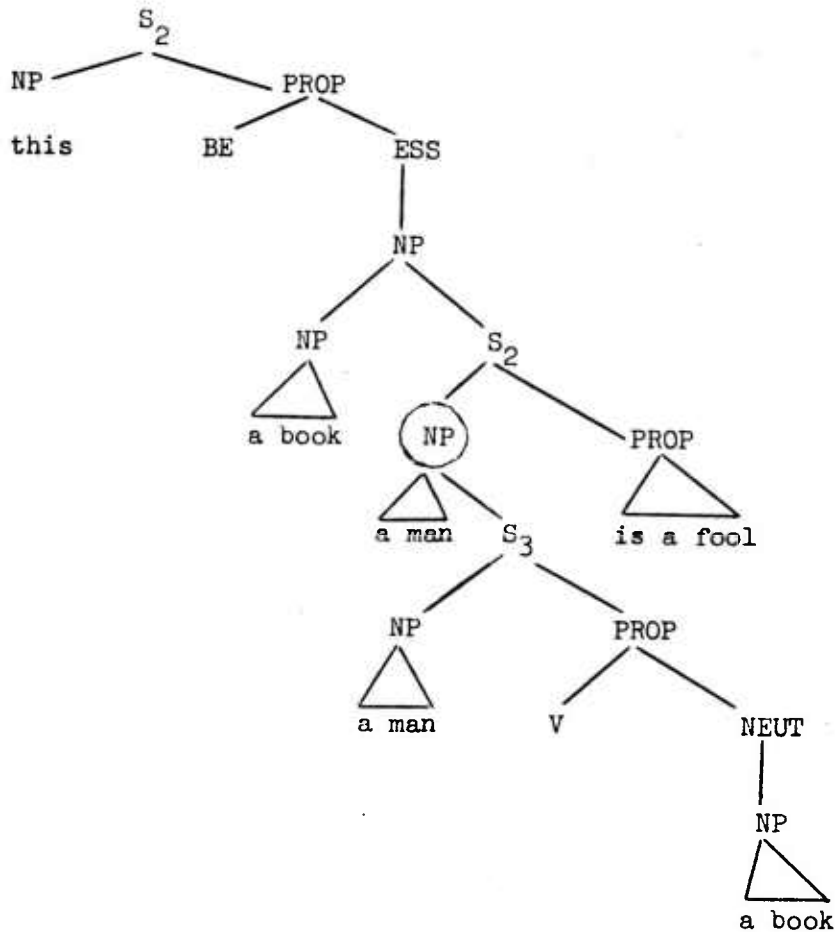
- a. "All feature-changing rules obey the same constraints as chopping rules." [6.193]
- b. "To say that a feature-changing rule obeys the Complex NP Constraint is to say that no element not dominated by a complex NP can effect changes in the sentence [immediately] dominated by that NP." [p. 455, MS]

Thus, illustrating with the NP-S analysis of relative clauses for the sake of simplicity, NP<sub>2</sub> in the structure below can change features in NP<sub>2</sub> but NP<sub>3</sub> cannot do so because it is not dominated by NP<sub>0</sub>:



Consequently, since a book in S<sub>1</sub> of (102') is not dominated by the circled NP in the example, it presumably cannot add the feature [+WH] to a book in S<sub>3</sub>, so that (102) would be blocked:

(102')



We have noted with reference to Indefinite Incorporation (see NEG) that there is good reason to agree with Ross's observation that his constraints apply to feature-changing rules. But Ross (MS p.356) specifically excludes the Pronominalization rule from these constraints, although it changes features. The exclusion of pronominalization from these constraints is justified by Ross on the grounds that "[+PRO] is not a feature like ...[+INDEFINITE]... it is an instruction to delete all or part of the constituents of the node to which it is attached." Though this is a tenuous distinction, it clearly must be made, since pronominalization is not subject to constraints on feature-changing rules. We have noted earlier the similarities between the relative pronouns and the personal pronouns, and it appears that in this respect they are similar too.

## IX. RULES

## A. WH-Rel Attachment

## 1. Nom-S Analysis

Structure Index

X	NOM	S[ # X	NP[ X ART NOM]	NP	X # ]	S	X
1	2	3 4	5 6 7		8 9	10	

Conditions

- (a) 2 = 7, and 4 ≠ x + that
- (b) 6 dominates  $\begin{bmatrix} +\text{SPEC} \\ -\text{DEF} \\ -\text{WH} \end{bmatrix}$
- (c) If there is a [+WH] anywhere within the S **immediately dominating 7, which is also [-REL], the structure index for this transformation is not met.**
- (d) The rule is obligatory.

Structure Change

- (a) Replace [-WH] in 6 by  $\begin{bmatrix} +\text{WH} \\ +\text{REL} \\ +\text{PRO} \end{bmatrix}$
- (b) Replace  $\begin{bmatrix} +\text{SPEC} \\ -\text{DEF} \end{bmatrix}$  in 6 by [+DEF]
- (c) Erase 7 and 3.
- (d) Replace 9 by half-fall.

Notes on the Rule

- 1. For a further discussion of reference and identity conditions, see Section II.D.2. of PRO (as well as the discussion of identity conditions in Section II of this paper).
- 2. For a discussion of Condition (b), see Section II.C of this paper.
- 3. Condition (c) is required to block relativization of embedded questions, such as (105), which would otherwise yield (106):

- (105)  $S[Tichbourne \text{ is the fink } S[A \text{ certain fink ate something}]_S ]_S$   
 $\begin{bmatrix} +WH \\ -REL \end{bmatrix}$

- (106) Tichbourne is the fink who what ate?

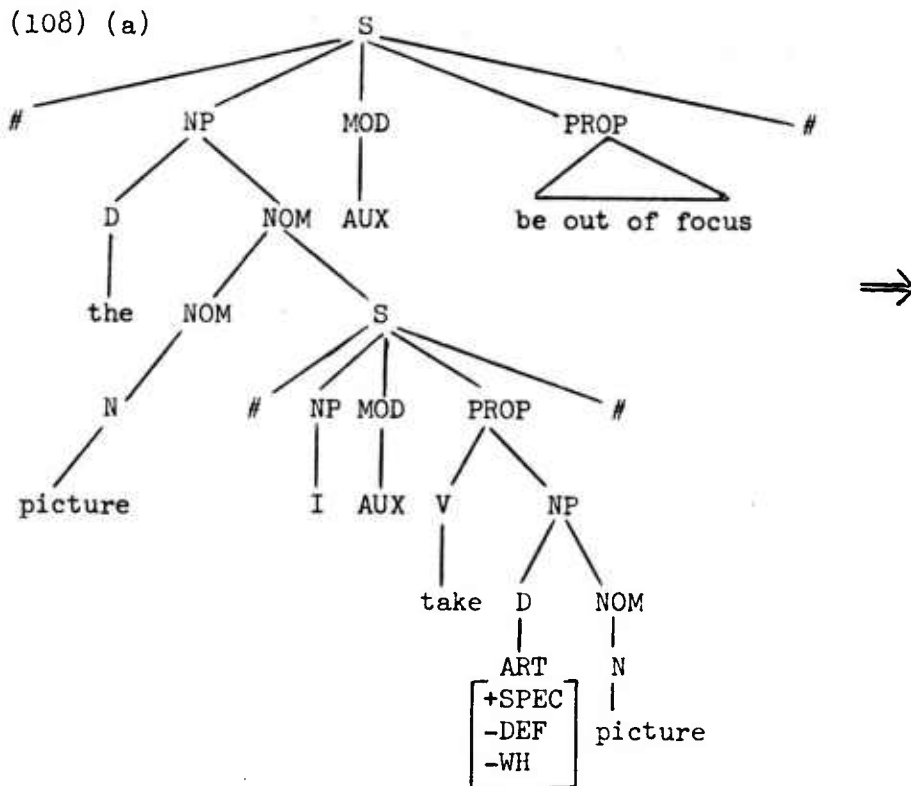
While (106) should probably be generated, it should not come from (105). If anything should come from (105) it should be (107):

- (107) Tichbourne is the fink who ate what?

but we propose no analysis of such rather special questions as (106) and (107).

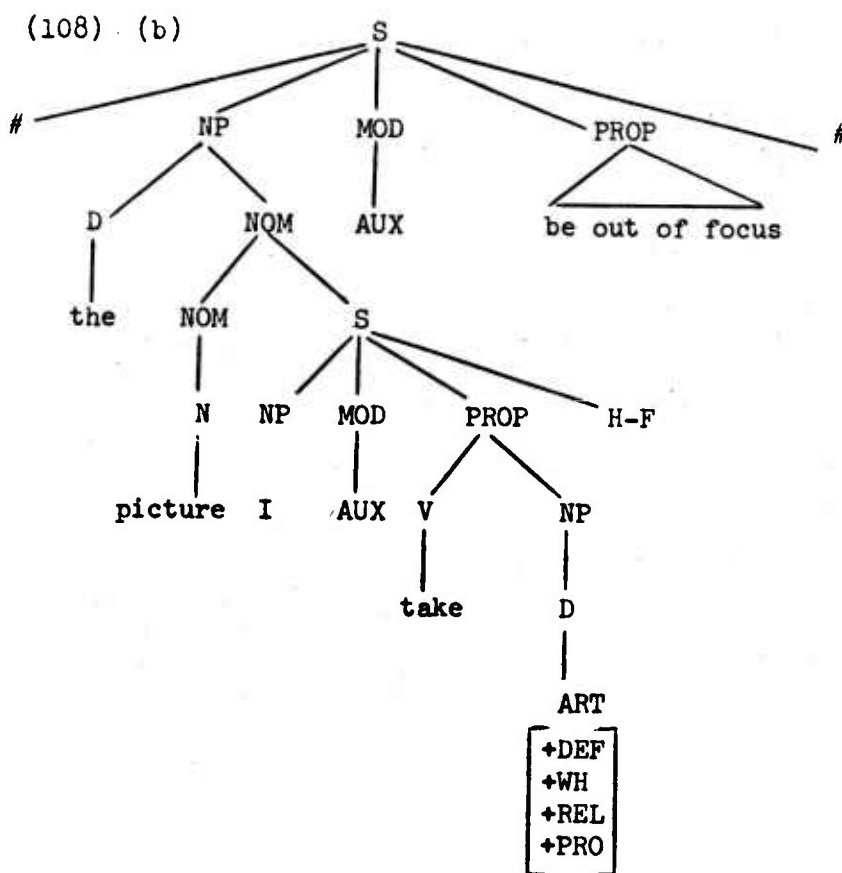
4. The general constraints discussed in Section VI make it unnecessary to state several restrictions which would otherwise have to be applied to this rule (depending on dialect [see Section VIII] and/or WH- fronting). See Section VI for the constraints involved and the ungrammatical sentences blocked.

5. Part (c) of the structure change of this rule is intended to provide a source for the typical intonation break of relative clause structures.



"The picture that I took was out of focus."

[The picture - I took a [certain] picture - was out of focus.]



[The picture - I took WH- the - was out of focus.]

## 2. NP-S Analysis

Structure Index

X	NP	S[	#	X	NP[	D	N]	NP	X	#	]S	X
1	2		3	4	5	6	7		8	9		10

Conditions

- (a) 2 = 5, and 4 ≠ x + that
- (b) If there is a [+WH] anywhere within the S immediately dominating 7, which is also [-REL], the structure index for this transformation is not met.
- (c) 6 dominates [-WH]
- (d) The rule is obligatory.

Structure Change

- (a) Replace [-WH] in 6 by 

+WH
+REL
+PRO
- (b) If 6 dominates [-DEF], replace it by [+DEF].
- (c) Erase 7 and 3.
- (d) Replace 9 by half-fall.

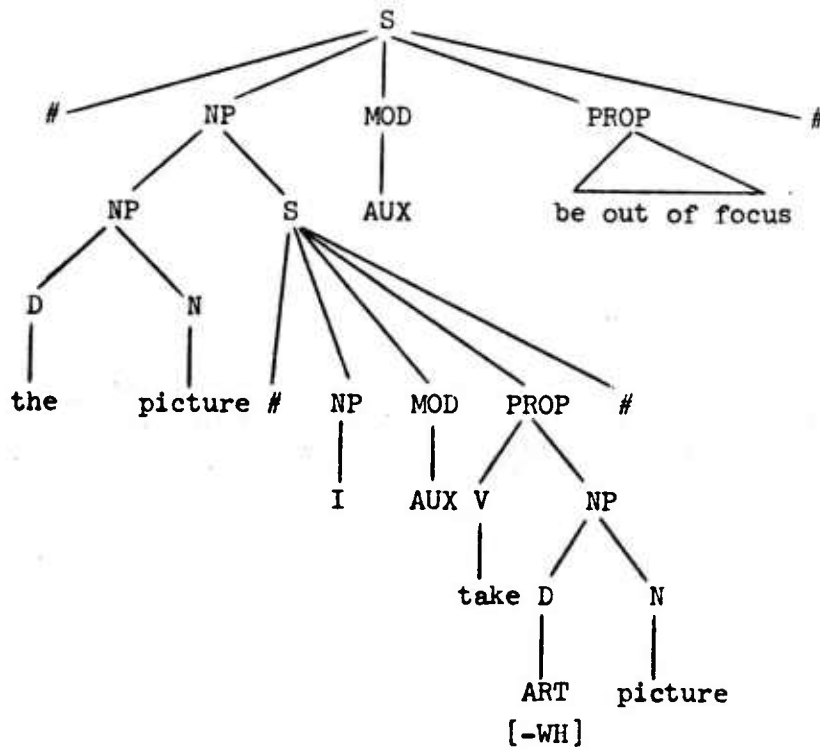
Notes on the Rule

1. The rule of definitivization is more complicated than S.C. (b), and probably precedes WH-REL-Attachment under the NP-S analysis (see II.b.2 above). We have not been able to work out the details satisfactorily.



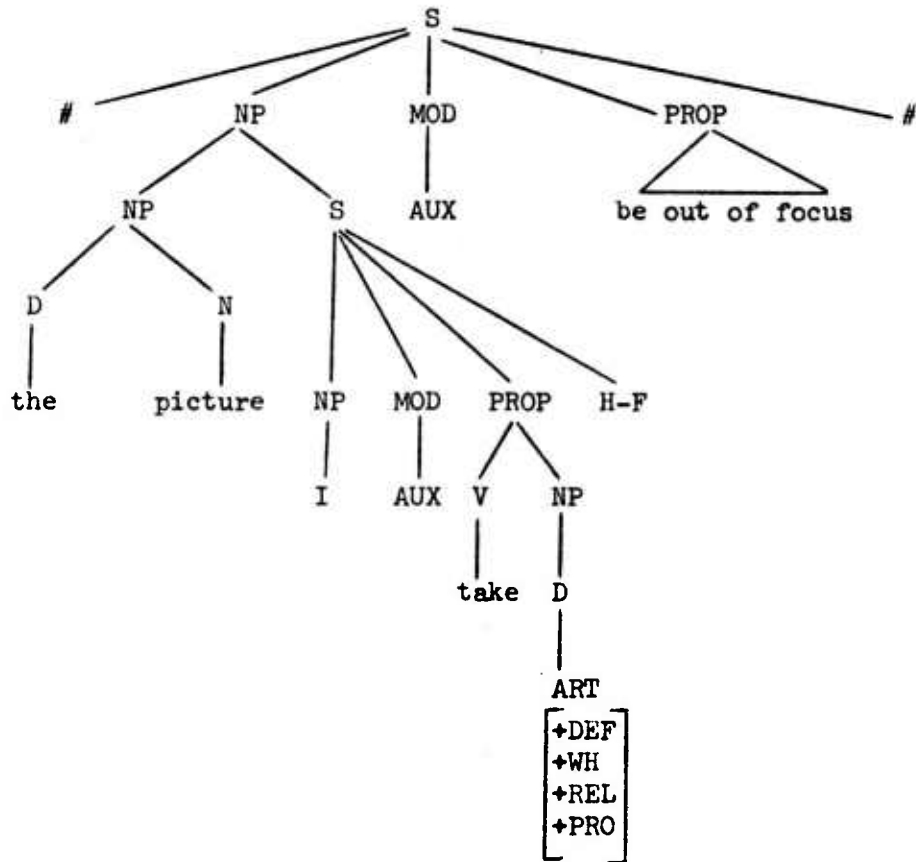
Example in tree format

(108') (a)



"The picture that I took was out of focus."  
 [The picture - I took the picture - was out of focus.]

(108') (b)



[The picture - I took WH- the - was out of focus.]

## 3. ART-S Analysis

Structure Index

X D[ X ART S[ # X NP[ ART N ]<sub>NP</sub> X # ]<sub>S</sub>]<sub>D</sub> N X  
 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Conditions

- (a)  $3 + 13 = 8 + 9$ , and  $6 \neq x + \text{that}$
- (b) If there is a [+WH] anywhere within 4 which is also [-REL], the structure index for this transformation is not met.
- (c) 8 dominates [-WH]
- (d) The rule is obligatory.

Structure Change

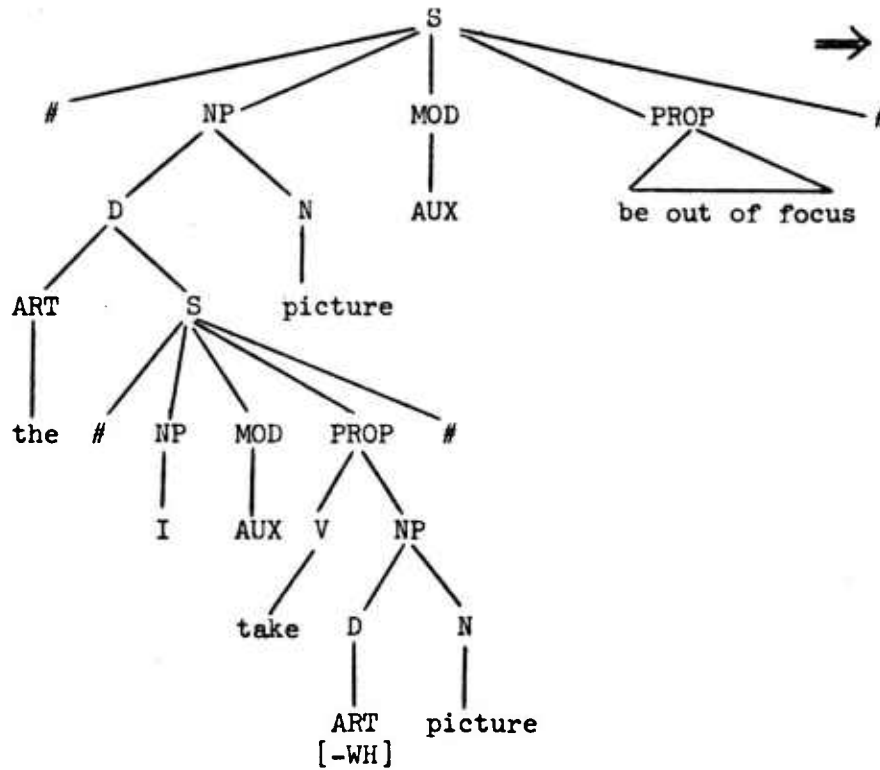
- (a) Replace [-WH] in 8 by  $\begin{bmatrix} +WH \\ +REL \\ +PRO \end{bmatrix}$
- (b) If 8 dominates [-DEF], replace it by [+DEF].
- (c) Erase 9 and 5.
- (d) Replace 12 by half-fall.

Notes on the Rule

1. Items 7-10 of the Structure Index are so formulated as to exclude stacking. Stacking can be allowed by replacing ART in 8 by D and requiring identity between  $3 + 13$  and the ART of  $8, + 9$ , employing a later rule to sort out the relative pronouns (see Section II.A.2).
2. Since the embedded sentence is dominated by the matrix determiner, it must be moved to the proper position by a later rule (IX.C).
3. As in the NP-S analysis, a rule of definitivization probably precedes WH-REL Attachment. Since this rule has not been worked out satisfactorily, S.C. (b) provides for definitivization in an ad hoc way.

Example in Tree Format

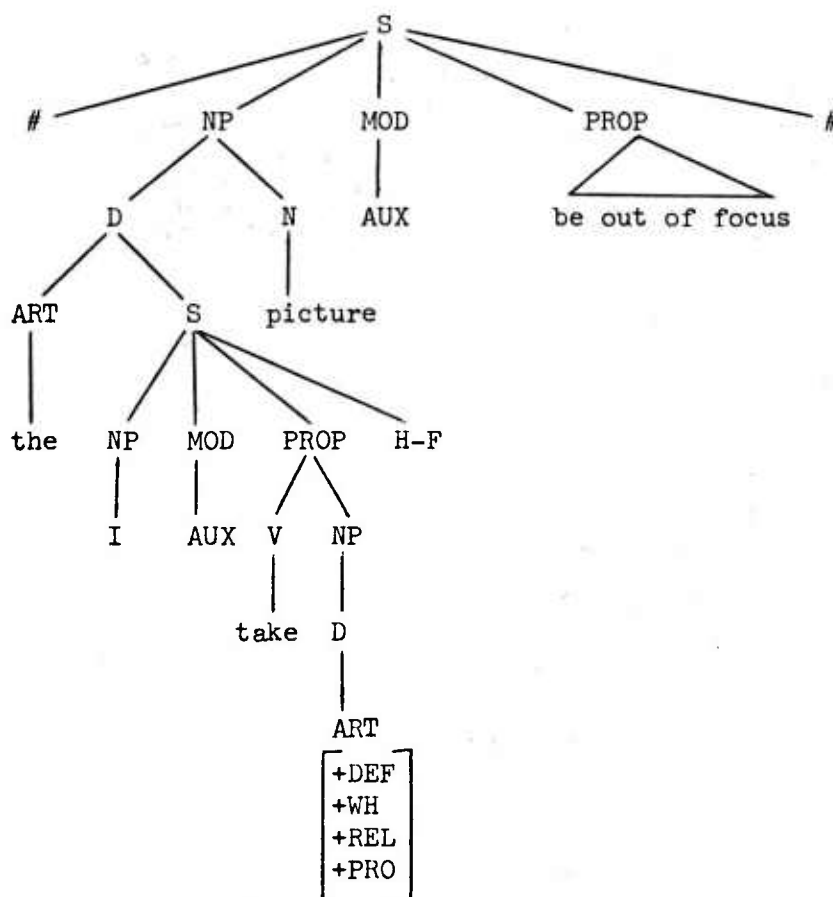
(108'') (a)



"The picture that I took was out of focus."

[The - I took the picture - picture was out of focus.]

(108'') (b)



[The - I took WH- the - picture was out of focus.]

## B. WH- Fronting

## 1. NOM-S, NP-S, and ART-S

Structure Index

X	S	[	X	NP	[	X	X	NP	[	ART	]	X
1	2	3		4	5	6	7	8				

Conditions

- (a) 7 dominates [+WH, +REL, +PRO, +DEF].
- (b) This transformation is subject to the general constraints discussed in Section VI.
- (c) The rule is obligatory.

Structure Change

Chomsky-adjoin 6 as left daughter of 2, OR  
 Chomsky-adjoin 5 + 6 as left daughters of 2  
 (in accordance with Pied Piping convention),  
 and erase original 6 or 5 + 6.

Notes on the Rule

1. The rule of WH- Fronting is invariant under the three analyses NOM-S, NP-S, ART-S, because the relevant nodes are S, NP, and ART, with the position in relation to the head noun playing no role in the rule.

2. For discussion and examples of general constraints see Section VI. In particular, see the following examples:

Complex NP Constraint (52, 53, 54)  
 Sentential Subject Constraint (59, 60)  
 Exhaustive S Output Condition (62)  
 Coordinate Structure Constraint (64)

3. The variables 4 and 5 are to allow the Pied Piping convention to divide up the NP PREP NP structure. See examples (66-71), (72-89).



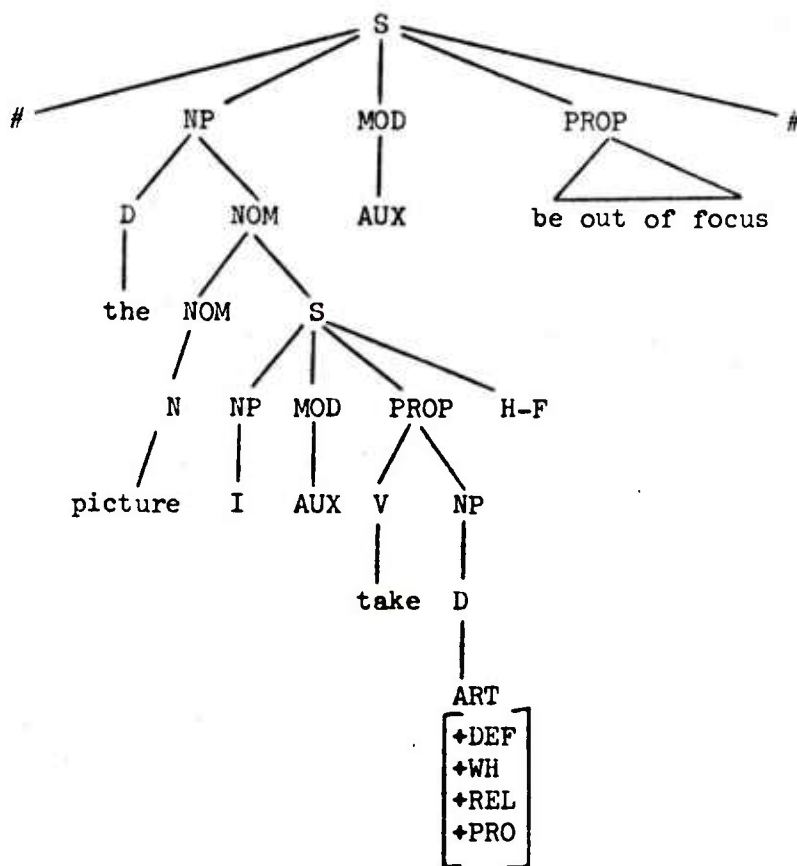
4. This rule is equivalent to Ross's (1967c) rule 4.135, different only in notational conventions.

5. Ross argues (1967c) for Chomsky-adjunction to S rather than sister-adjunction to 3 so that the coordinate structure constraint will apply in cases where 3 is null. Chomsky-adjunction guarantees that constituent 7 will be moved, since the coordinate structure constraint applies only to movement. Thus even if  $X_3$ ,  $X_4$ , and  $X_5$  are null, there will still be movement of  $X_7$  and one cannot relativize on (109.a) to derive (109.b):

- (109) (a) The boy and the girl embraced.  
 (b) \*The boy who and the girl embraced is my neighbor.

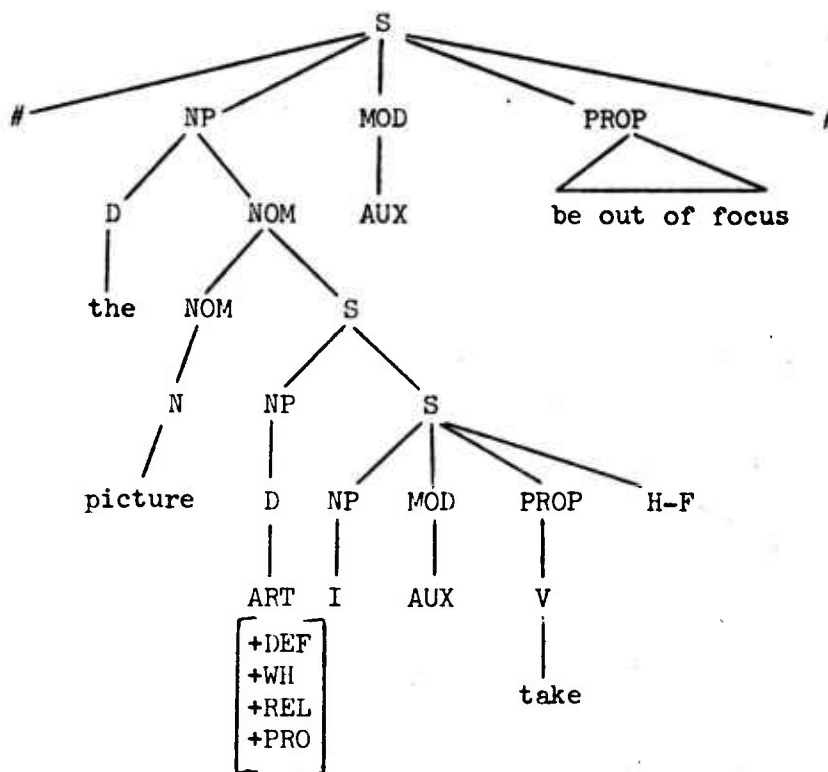
Example in Tree Format, NOM-S and NP-S

(108) (b)



[The picture - I took WH- the - was out of focus.]

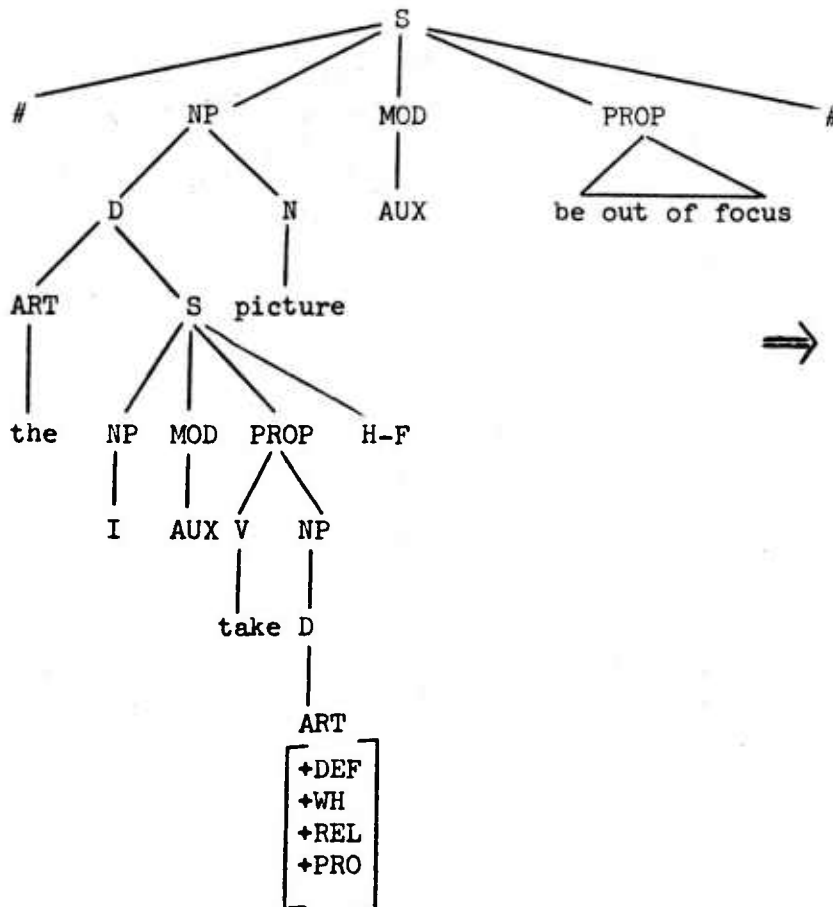
(108) (c)



[The picture - WH- the I took - was out of focus.]

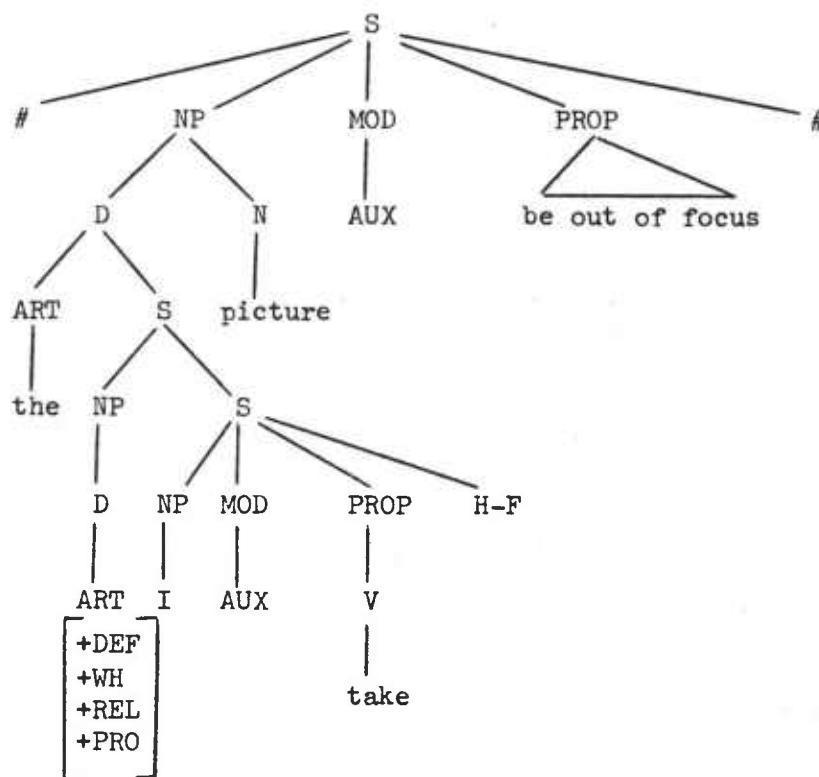
Example in Tree Format, ART-S

(108'') (b)



[The - I took WH- the - picture was out of focus.]

(108'') (c)



[The - WH- the I took - picture was out of focus.]

## C. Clause-Positioning Rule, ART-S Only

Since the relative clause is generated as a constituent of D, all relative clauses in the ART-S analysis must be properly positioned as constituents of the head-noun NP by a clause-positioning rule.

Structure Index

$$\begin{array}{ccccccc} X & & NP[ & X & ^D[ & S & ] & X & ] & X \\ & & 1 & & & 2 & & 3 & & \end{array}$$
Conditions

- (a) 2 dominates  $\begin{bmatrix} +WH \\ +REL \\ +PRO \end{bmatrix}$
- (b) 2 does not dominate an S which dominates  $\begin{bmatrix} +WH \\ +REL \\ +PRO \end{bmatrix}$
- (c) 1 is the highest NP dominating 2.
- (d) The rule is obligatory (but see VIII above).

Structure Change

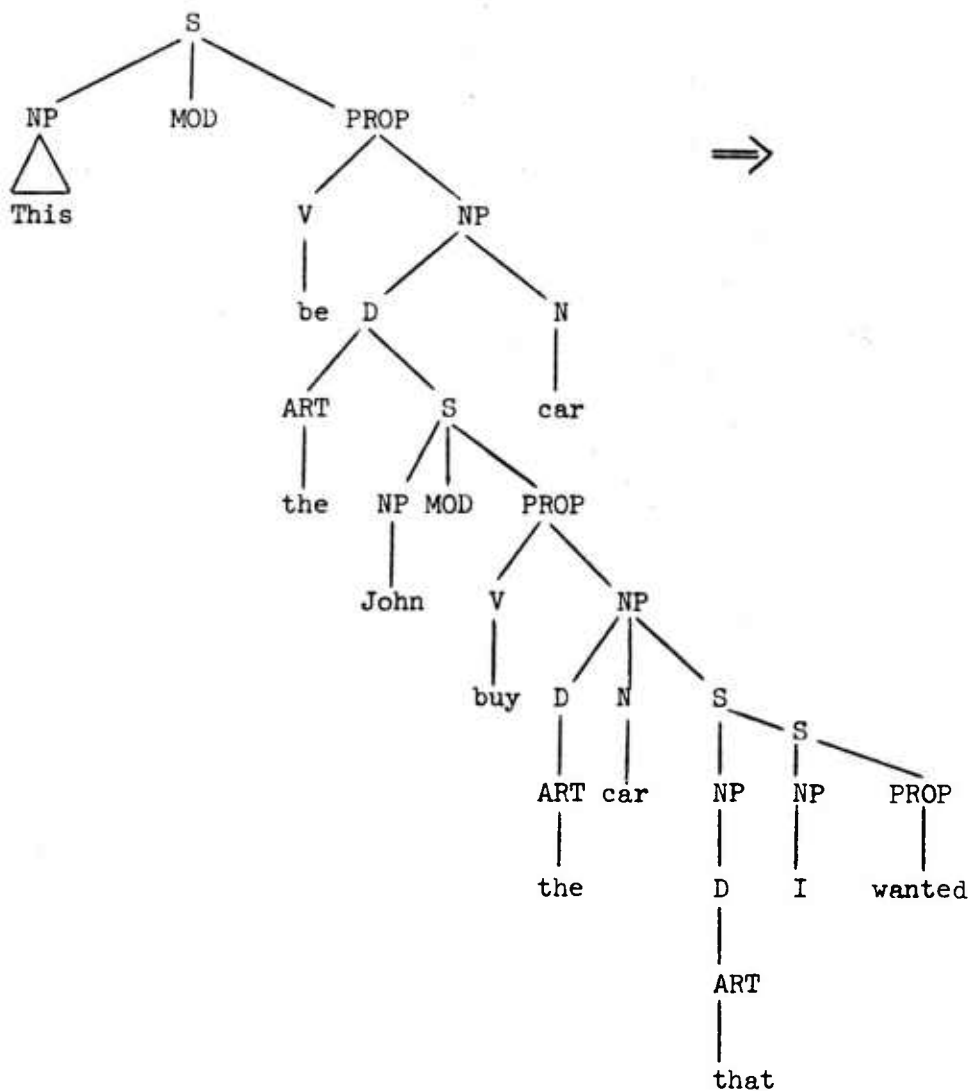
Attach 2 as right daughter of 1.

Notes on the Rule

- Condition (a) insures that this rule applies only to relative clauses.
- Condition (b) is to insure that if we are dealing with a deep-structure stacked relative clause construction (as in Section III), that the rule will apply first to the most deeply-embedded clause. Note that this rule can reapply indefinitely. In a stacked relative, once the most deeply-embedded clause has been positioned, (see (112.c)), that clause is the X provided for by variable 3 and condition (b) is once again met, allowing the application of the rule to the next most deeply embedded clause on the next cycle. The rule works its way up the tree, attaching one relative clause at a time to the head noun in the normal progress of the cycle.

3. Condition (c) insures that the clause is adjoined to the head-noun NP rather than some intermediate NP which also dominates 2 in such stacked constructions as (112.b), where either the car of the topmost S or the car of the string John bought the car would otherwise meet the structural description of the rule. The most deeply embedded clause must not be adjoined to an intermediate NP because doing so creates the following problem:

(110) (a)

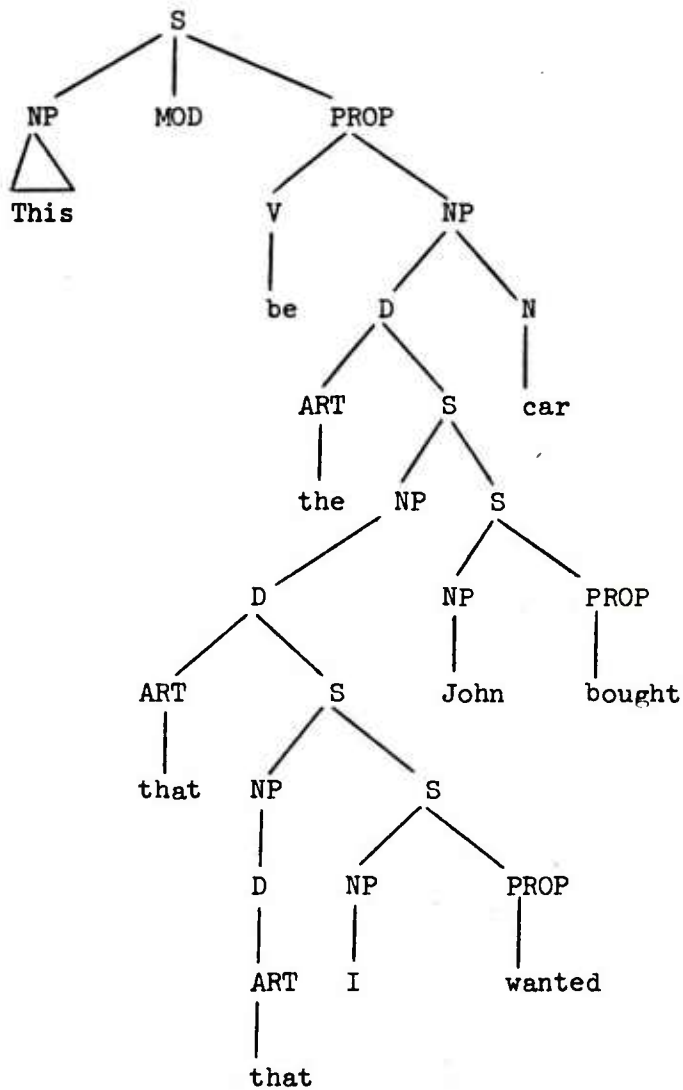


Structure after first cycle:

"This is the car that I wanted that John bought."  
 [This is the - John bought the - that I wanted - car.]

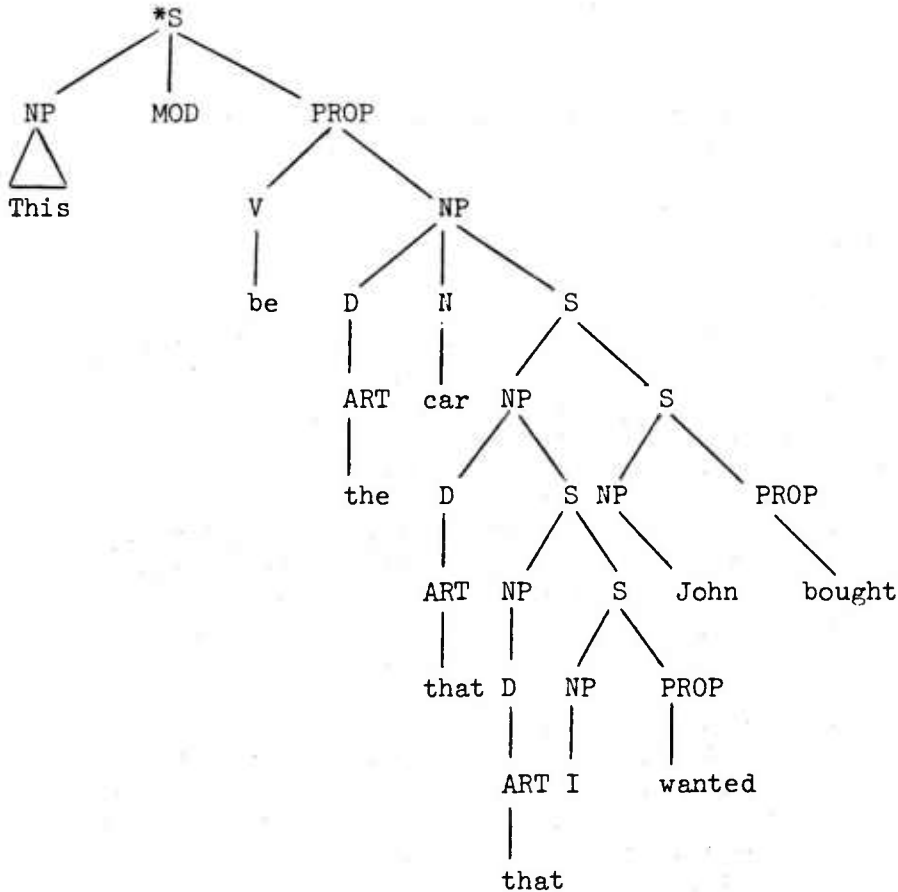


(110) (b)



Structure after second cycle, with the lowest REL having been positioned at the end of immediately dominating NP rather than top-most NP.

(110) (c)



Structure after third cycle, with the higher REL having been positioned at the end of its immediately dominating NP

If, after the first cycle in the derivation (110), the lowest clause has been adjoined to an intermediate dominating NP, as in (110.a), then on the next cycle, as a result of WH- attachment and fronting, the structure is (110.b), since the NP which is fronted dominates the lower clause. The subsequent positioning of the second-most-deeply-embedded clause yields (110.c), which is ungrammatical. There are several solutions to this problem other than our condition (c) on the positioning rule, but they are either ad hoc or lead to new problems. One could make the positioning rule apply to the relevant ART or D nodes, but this will reverse the clauses and complicate the semantic interpretation which in stacking depends on the assumption that the higher relative modifies the head noun as in turn modified by any lower relative. A second

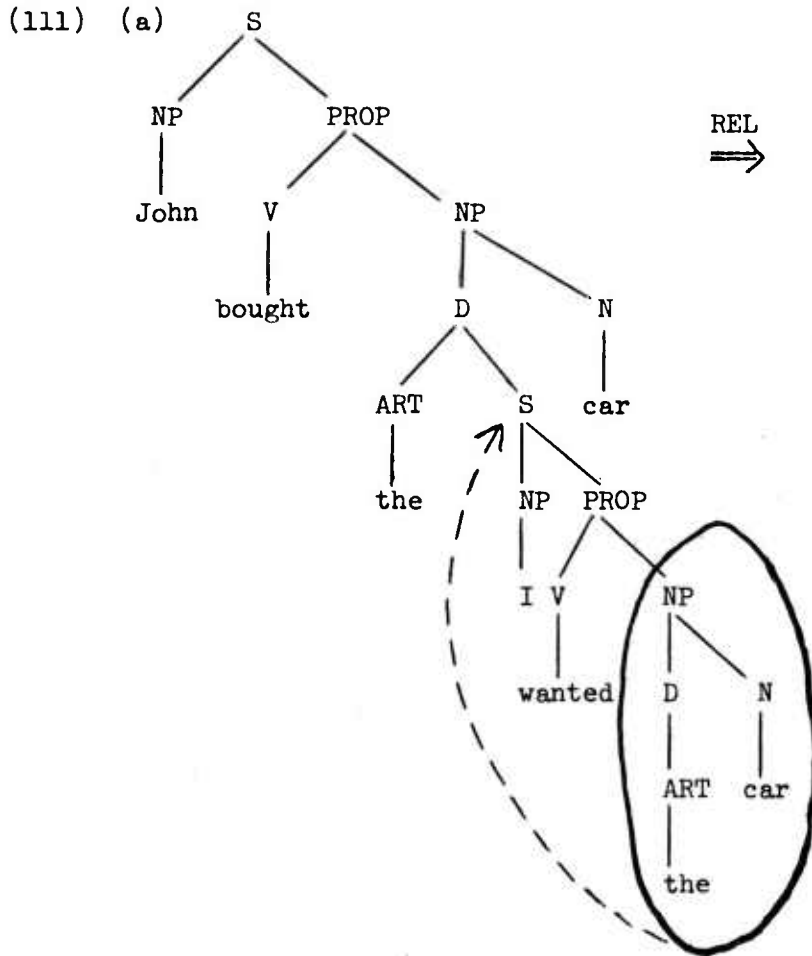
alternative would be to have a special transformation solely for the purpose of unscrambling the that-that-PROP-PROP structure of (110.c). This is a particularly bad alternative since the rule could be defended only in terms of grammar-dependent arguments - i.e. the other rules created a mess that had to be cleaned up. A third alternative is to make the positioning rule last-cyclic, moving from bottom to top of the tree and attaching all relative clauses to the topmost NP. It is clear that the present proposal is to be preferred to any of these, since if no stacking is generated at all the present rule is the one needed anyway.

While there are no conditions on this rule to specifically guarantee that the N of the head NP in a stacked construction is in fact identical (in whatever sense is required for relativization) to the embedded N which has been relativized, such a consequence is automatic. If, for example, the N in the NP of the top S in (112) is guttersnipe instead of car, on the lowest cycle, REL- attachment and WH- fronting will take place, and then the lowest clause will be attached to the NP the guttersnipe in the top S. However, on the next cycle, REL- attachment will be blocked because of the non-identity of car and guttersnipe. Therefore the sentence boundaries in the string John bought the car will not be erased and eventually the structure will be cast onto the scrap-heap as are all sentences which have internal occurrence of sentence boundaries at the surface structure level.

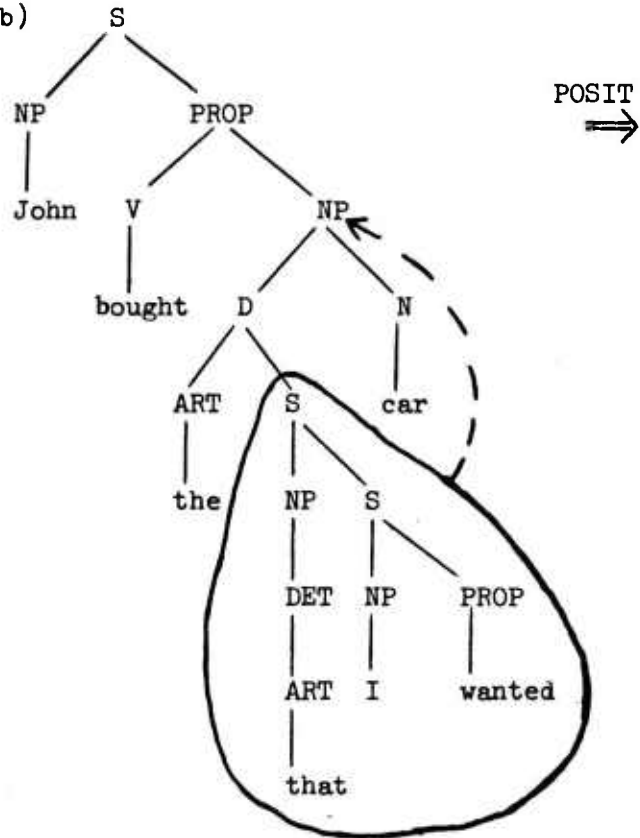
4. Note that by attaching the relative clause, however deeply-embedded, directly to the head-noun NP, a rather simple surface structure is derived, one that appears to be intuitively correct, particularly if it is true, as has been argued, that one of the major functions of the transformational rules is to "flatten" or simplify deep structures.

Examples in tree format

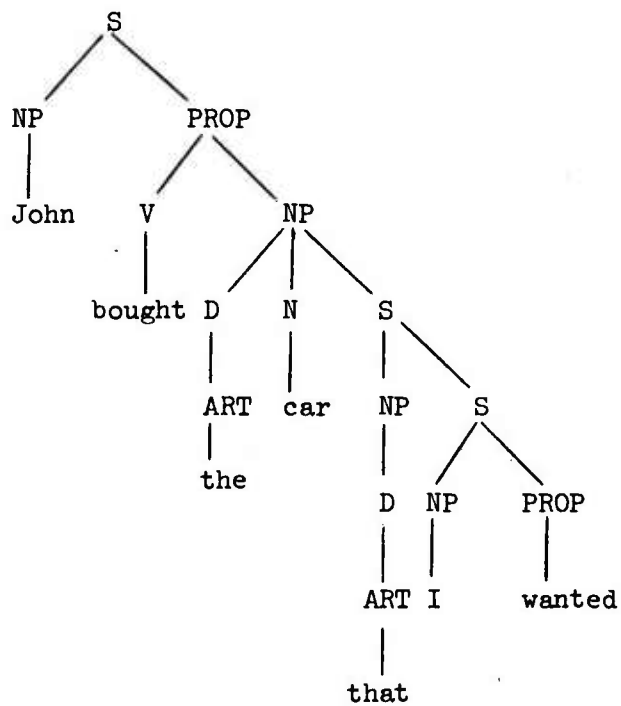
The series of trees (111) and (112) schematically illustrate the operation of relativization under this analysis for simple (one-clause) and stacked relative clause sentences (where REL includes both REL- attachment and WH- fronting).



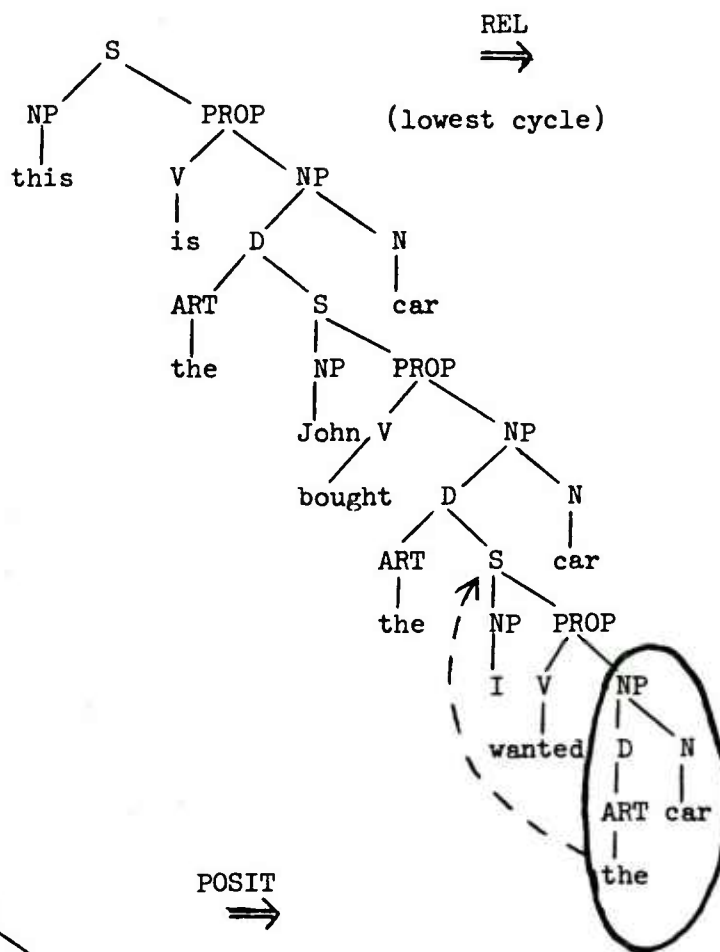
(111) (b)



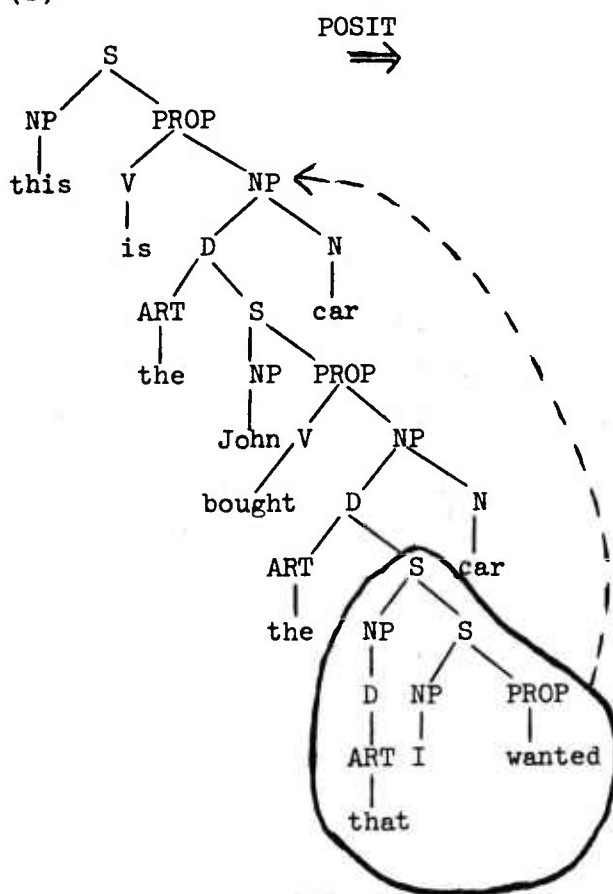
(c)



(112) (a)



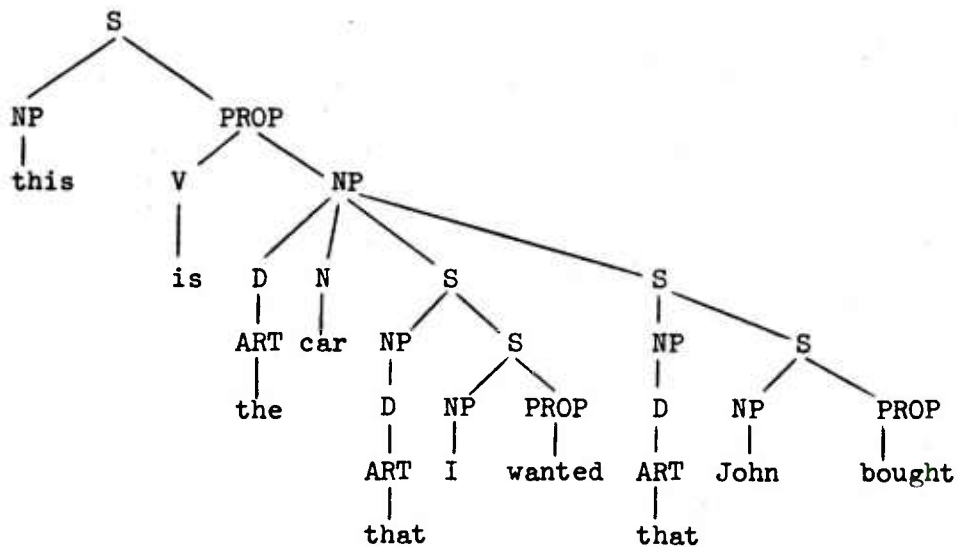
(b)







(e)



From this point on in the rules, all rules will be formulated in terms of the NOM-S analysis, as the processes involved are essentially the same in all three analyses.

#### D. R-REL-that

##### Structure Index

X	ART	X
	<div style="border: 1px solid black; padding: 5px; display: inline-block;">           +WH +REL +PRO +F         </div>	
1	2	3

##### Conditions

- (a) 1 is not X + PREP.
- (b) The rule is optional.

##### Structure Change

- (a) Attach the feature [+THAT] to 2.

Notes on the rule

1. This rule must follow WH-REL-fronting.
2. Though this rule is, in some ways, close to being no more than a morphophonemic rule (it simply provides a necessary feature for the morphophonemic component to interpret), the rule of that-deletion (below) depends on being able at this point in the syntax to identify those relative pronouns that have the form that as distinct from all others. That-deletion in turn depends on being able to discriminate between that's which are relative pronouns and that's which are conjunctions, since the conditions for deletion are distinct.

Examples

## A. Grammatical

(114) The boy that just left was a friend of mine.

(115) People that live in glass houses...

## B. Ungrammatical and blocked

(116) \*The boy to that I said something left early.

(117) \*The boy I said something to that left early.  
(i.e. "The boy I said something to whom left early.")

E. R-REL-that-Deletion (Optional)Structure Index

X	ART	NP	X
	[+THAT +REL]		
1	2	3	

Structure Change

- (a) Erase 2.

Notes on the Rule

This form of the rule assumes that that-deletion is not general. Other instances of apparent that-deletion are handled in an entirely different way (see NOM).

Examples

## A. Grammatical

(118) The boy (that) he said was here...

## B. Ungrammatical and blocked

(119) \*The boy (that) left early was my flying instructor.

## F. REL-Reduction (Optional) - A

Structure Index - A

X	NOM	S[	ART	TNS	BE	X	]S	X
	[-PRO]		[+REL]					
<hr/>								
1		2		3		4		5

Structure Change - A

(a) Delete 3.

(b) Attach 4 as right daughter of 1.

Notes on the Rule

1. This is the first of two rules for REL-Reduction; the second applies in case there is no BE in the appropriate string.

2. 4 is attached as right daughter of 1 in order to eliminate intermediate structure, including S; that is, there are reasons for asserting that when a deep structure S has lost a certain amount of its internal structure it is no longer an S.

3. -ing and -en insertion applied while the REL S was in its first cycle (its reduction to the present form occurred on the second cycle). Likewise NEG placement, so that when this rule applies NEG is after BE in the structure index, and  $X_4$  therefore includes it, for sentences like "A student not involved in the study of syntax hardly knows how fortunate he is".

4. See Section VII of this paper for discussion of REL-Reduction.

5. There are several other restrictions on this and the following transformation that we have not yet built into the rules, such as the fact that in a series of relative clauses, if the first clause is not reduced, none of the following clauses may be reduced if they are also on the same noun, so that from (120) one should be able to get (121), but not (122):

(120) This is the car that John bought that I wanted.

(121) This is the car John bought that I wanted.

(122) \*This is the car that John bought I wanted.

and perhaps not even (123):

(123) This is the car John bought I wanted.

Also, one would not want to be able to reduce to get sentences such as (124) from (125):

(124) \*I know a man tall.

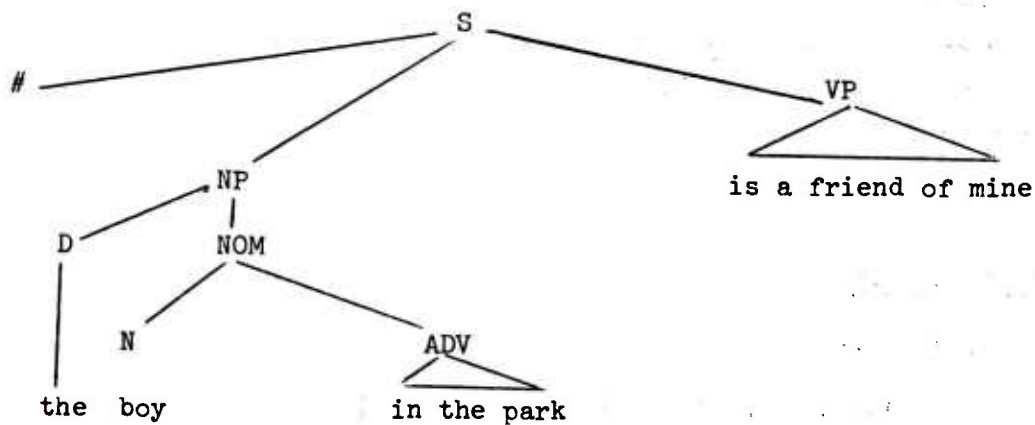
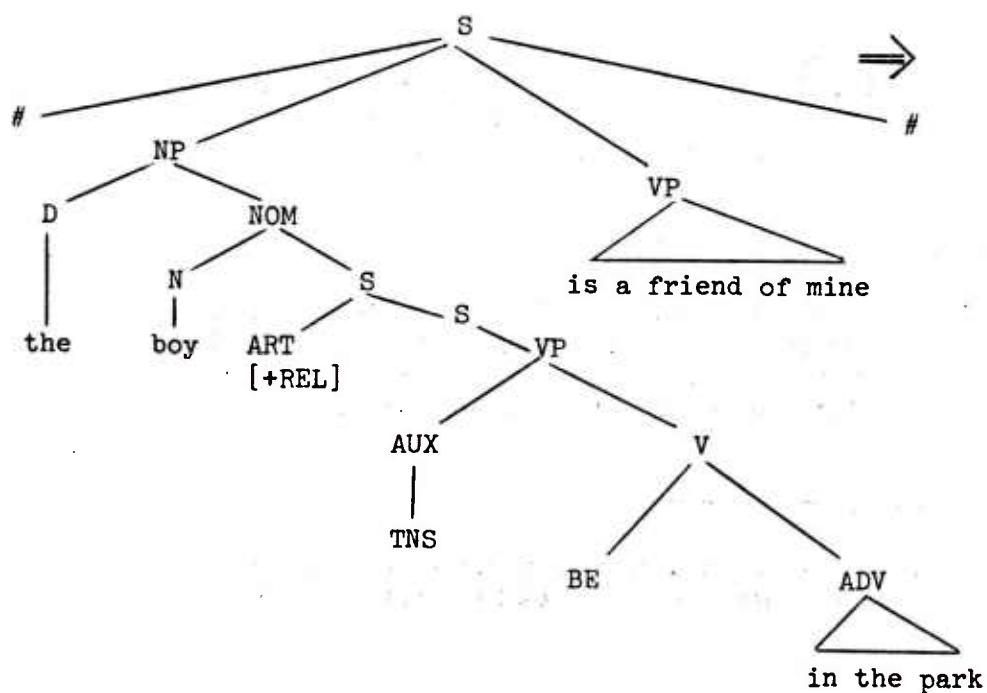
(125) I know a man who is tall.

In order to avoid (124) as a surface structure, ADJ pre-positioning (Rule G) is obligatory.

Examples

## A. P-Markers

(126) The boy in the park is a friend of mine.





## B. Grammatical

- (127) A boy (who is) working on the farm...
- (128) A boy (who is) on the farm...
- (129) A boy (who is) being killed by snakes...
- (130) A boy (who is) nice...(Intermediate stage; the ADJ-Preposition rule, being obligatory given this optional reduction, assures that (72) can't remain as final output.)

## C. Ungrammatical and blocked

- (131) \*He in the park is a friend of mine. (Though the rules up to this point allow "He who is in the park...", the present rule does not allow reduction of such sentences.)

## D. Grammatical from other rules

- (132) I saw the student studying in the library.  
(From other rules, namely complementation.)

## G. REL-Reduction (Optional) - B

Structure Index - B

X	NOM [-PRO]	S[	ART [+REL]	X	TNS	(NEG)	V	X	]S	X
<hr/>							<hr/>		<hr/>	
1		2	3	4	5	6	7	8		

Structure Change - B

- (a) Delete 3.
- (b) Attach -ing to 5, erasing [<sup>†</sup> PAST], or  
If 5 dominates [+ PAST], attach ing have en as daughters of 5, and erase [+ PAST].
- (c) Attach 4 - 7 as right daughters of 1.

Notes on the Rule

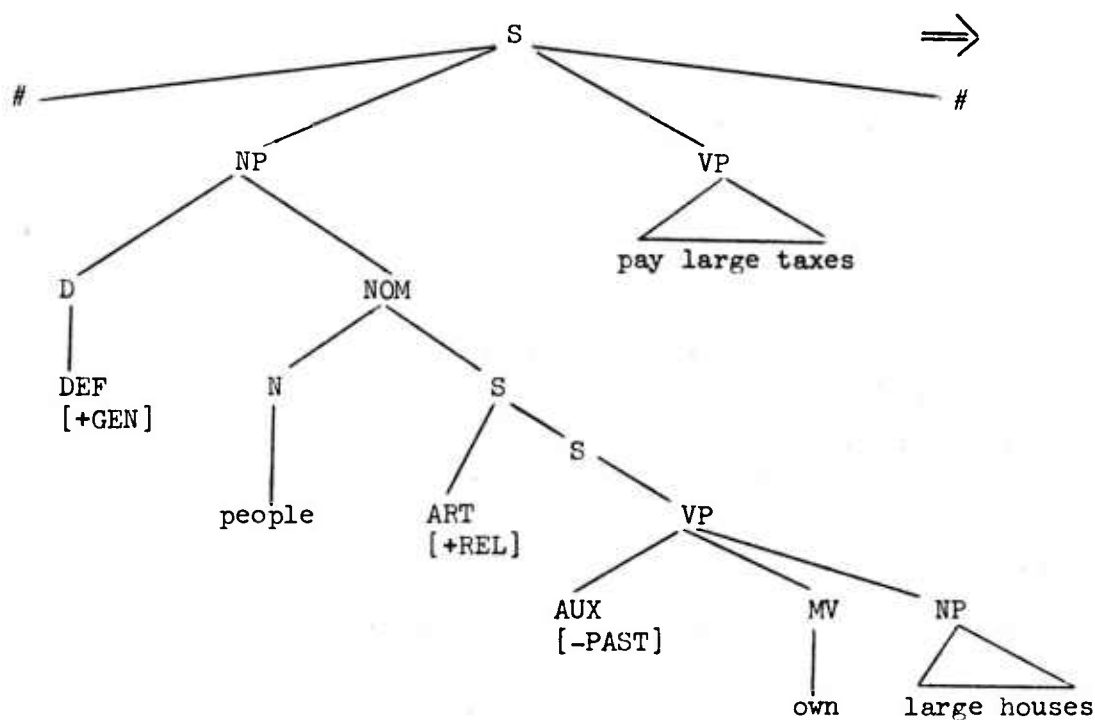
1.  $X_4$  is provided on the assumption that pre-verbal adverbs like only may still be in this position. NEG is separately mentioned because it has been moved to the position after TNS in the first cycle. These details may be incorrect, but there appears to be no problem in principle of stating them within the terms of this rule.

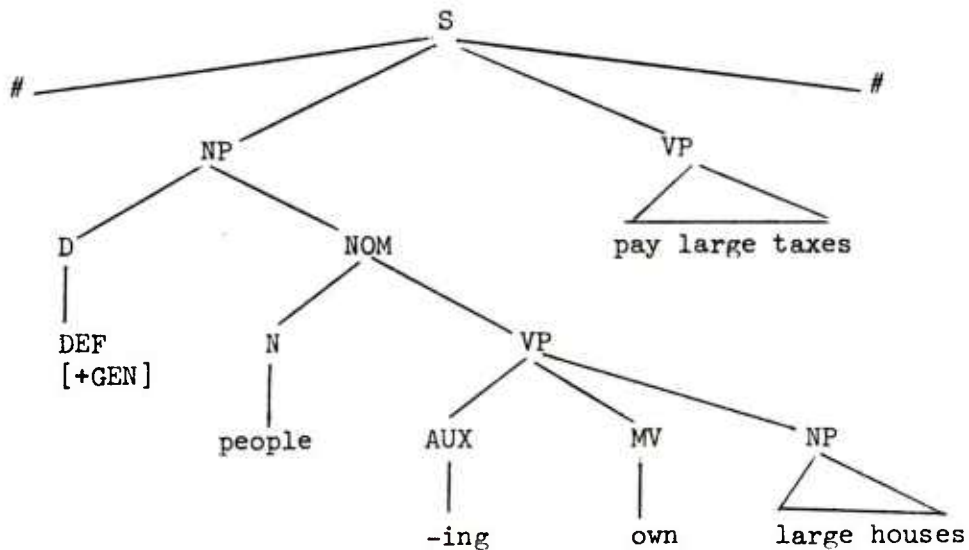
2. Structure change (c) is for the same reasons, and has the same consequences, as the similar attachment provided for in REL-Reduction-A.

Examples

## A. P-Markers

(133) People owning large houses pay large taxes.





## B. Grammatical

- (134) Anyone having undergone yesterday what he underwent deserves a vacation. (Deep structure must be "Anyone who underwent yesterday...")
- (135) Anyone undergoing yesterday what he underwent deserves a vacation. (Same deep structure as (76), but have-insertion is optional.)
- (136) Planes flying low are less likely to create sonic booms, but they're just as annoying.
- (137) Anyone not having read more than one book this past week is one book up on me.

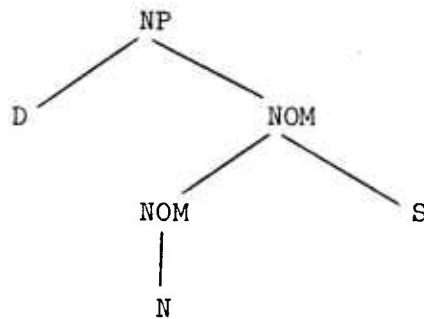
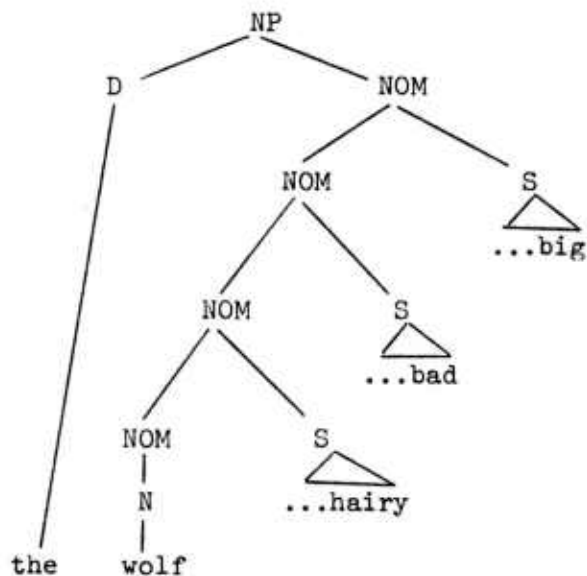
## C. Ungrammatical and blocked

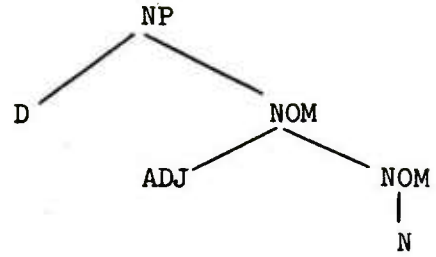
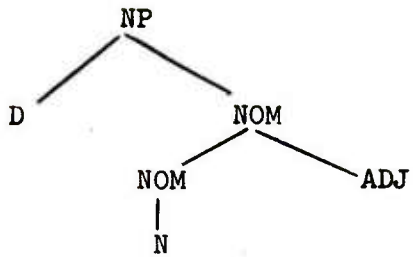
- (138) \*I owning a large house pay large taxes.

## H. ADJ-Pre-Position

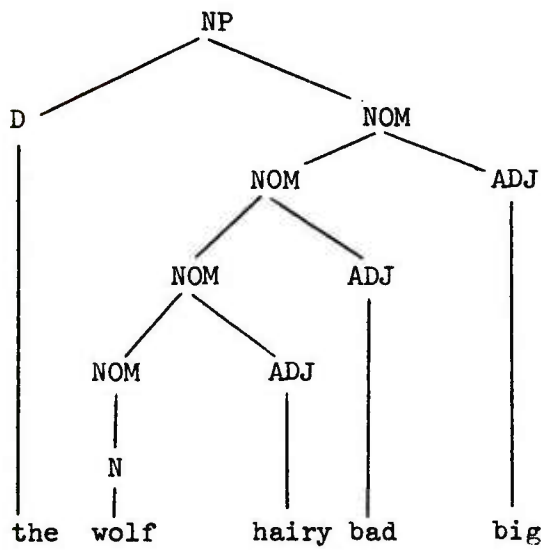
## INTRODUCTION

Only the REL immediately following the head noun (assuming several REL's in a stacked row) will meet the structure index for REL-Reduction. Once reduced, if it is an ADJ, this rule places it obligatorily in front of the head noun; the next REL, now immediately following the head noun, is also subject to reduction and placement in front of the head noun AND in front of the ADJ already moved, thus inverting the order of stacked REL's containing ADJ's. At the moment, following a suggestion from Ross, we are regarding the constraints on prenominal adjective ordering as a surface constraint, as there seems to be no comparable constraint on stacked relative clauses.

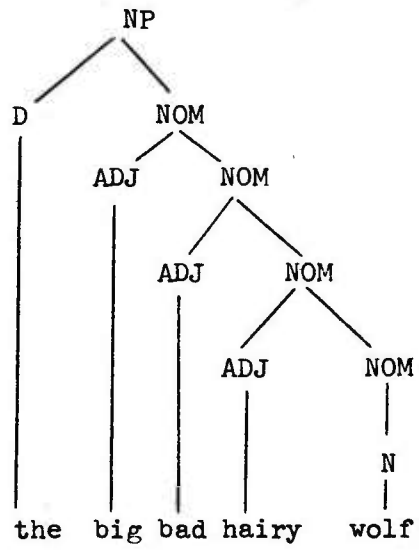
Deep



REL-Reduction



ADJ-Pre-Pose



December 1968

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## 13. ABSTRACT

## Integration of Transformational Theories on English Syntax

This study attempts to bring together most of the information about the transformational analysis of the grammar of English that was available up through the summer of 1968, and to integrate it into a single coherent format. The format chosen is that of C. Fillmore (the "Deep Case" hypothesis) combined with the "Lexicalist" hypothesis of N. Chomsky. The areas of close investigation were the determiner system; pronominalization; negation; conjunction; relativization; complementation and nominalization; the systems of interrogative, passive, imperative, and cleft sentences; the genitive; the lexicon; and the ordering of rules for these areas of the grammar.



14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
English Syntax Transformational Grammar Case Grammar Deep Case Hypothesis Lexicalist Hypothesis Determiners Pronominalization Negation Conjunction Relativization Complementation Nominalization Interrogative Imperative Genitive Cleft Passive Lexicon Case Placement						